Technical Report 71-17

HumRRO

AD 739706

Selection and Training for Small Independent Action Forces: Development of Materials and Procedures

Joseph A. Olmstead, Theodore R. Powers,
James A. Caviness, and Jeffery L. Maxey

HUMAN RESOURCES RESEARCH ORGANIZATION
300 North Washington Street • Alexandria, Virginia 22314

DDC
RECEIVED
AUG 12 1972
F

Approved for public release; distribution unlimited

August 1971

Sponsored by

Advanced Research Projects Agency, Department of Defense
ARPA Order No. 1257

Monitored by

Advanced Research Projects Division
Research and Engineering Directorate
U.S. Army Missile Command

55

Reproduced by
NATIONAL TECHNICAL
INFORMATION SERVICE
Springfield, Va. 22151

BIBLIOGRAPHIC DATA SHEET	1. Report No. HumRRO-TR-71-17	2.	3. Recipient's Accession No.

4. Title and Subtitle

SELECTION AND TRAINING FOR SMALL INDEPENDENT ACTION FORCES: Development of Materials and Procedures

5. Report Date August 1971

6.

7. Author(s) Joseph A. Olmstead, Theodore R. Powers, James A. Caviness, and Jeffery L. Maxey

8. Performing Organization Rept. No. TR 71-17

9. Performing Organization Name and Address

Human Resources Research Organization (HumRRO)
300 North Washington Street
Alexandria, Virginia 22314

10. Project/Task/Work Unit No. ARPA Order 1257

11. Contract/Grant No. DAAH01-70-C-0488

12. Sponsoring Organization Name and Address

Advanced Research Projects Agency, Department of Defense
Washington, D.C. 20301

13. Type of Report & Period Covered 2nd report in series of 3

14.

15. Supplementary Notes HumRRO Division No. 4, Fort Benning, Georgia. The preceding report in this series of three was: *Selection and Training for Small Independent Action Forces: System Analysis and Development of Early Training*, Technical Report 70-102.

16. Abstracts

This report of Phase II of a three-phase research and development project describes the completion of the systems analysis and specification of the critical knowledges and skills required for Small Independent Action Forces (SIAF) performance, and development of 19 Program Descriptions—training procedures and materials for developing the required knowledges and skills. (Program Descriptions had been developed in Phase I for 6 other content areas.) In addition, there is a description and provisional evaluation of a test battery for the selection of SIAF personnel. From a survey of current practices and job analysis data, candidate predictor variables were specified and instruments to measure the variables were identified or developed. Criterion tests of SIAF performance were developed for Phase III validation of selection procedures.

17. Key Words and Document Analysis. 17a. Descriptors

*Military training
*Performance evaluation
*Personnel selection

17b. Identifiers/Open-Ended Terms

Insurgency training
Small Independent Action Forces
Combat elements

17c. COSATI Field/Group 0509 Behavioral and social sciences Personnel Selection, Training, and Evaluation

Approved for public release; distribution unlimited

19. Security Class (This Report)	21. No. of Pages
UNCLASSIFIED	
20. Security Class (This Page)	**22. Price**
UNCLASSIFIED	

The Human Resources Research Organization (HumRRO) is a nonprofit corporation established in 1969 to conduct research in the field of training and education. It is a continuation of The George Washington University, Human Resources Research Office. HumRRO's general purpose is to improve human performance, particularly in organizational settings, through behavioral and social science research, development, and consultation.

Published
August 1971
by
HUMAN RESOURCES RESEARCH ORGANIZATION
300 North Washington Street
Alexandria, Virginia 22314

HumRRO

Technical Report 71-17

Selection and Training for Small Independent Action Forces: Development of Materials and Procedures

Joseph A. Olmstead, Theodore R. Powers, James A. Caviness, and Jeffery L. Maxey

HUMAN RESOURCES RESEARCH ORGANIZATION
HumRRO Division No. 4
Fort Benning, Georgia

This document may be further distributed by any holder only with specific prior approval of Director, Advanced Research Projects Agency, Washington, D.C., 20301.

August 1971

This research was sponsored by the Advanced Research Projects Agency of the Department of Defense under ARPA Order 1257 and was monitored by the U.S. Army Missile Command under Contract Number DAAHO1-70-C-0488. Views and conclusions expressed herein are the primary responsibility of the author or the contractor, and should not be interpreted as representing the official opinion or policy of USAMICOM, ARPA, DOD, or any other agency of the Government.

FOREWORD

This report describes activities performed by Human Resources Research Organization staff members during the second phase of a project whose overall objective is the development of procedures for selecting and training personnel to serve in Small Independent Action Forces (SIAF). The project is being conducted by HumRRO for the Advanced Research Projects Agency of the Department of Defense. This report describes the development of selection procedures and training materials based upon performance requirements that were identified in the first phase of the project.

The work on Phase II was begun in August 1970 and completed in June 1971. It was conducted by HumRRO Division No. 4, Fort Benning, Georgia. Dr. T.O. Jacobs, Director of Division No. 4, and Dr. Joseph A. Olmstead are serving as Co-Principal Investigators. Mr. Theodore R. Powers supervised the development of training materials. Other staff members concerned with training materials were LTC (Ret) Frank L. Brown, LTC (Ret) Clarence J. Bushaw, LTC (Ret) Fred K. Cleary, LTC (Ret) Paul F. Ferguson, and LTC (Ret) George J. Magner. Dr. James A. Caviness supervised the development of selection procedures. Other staff members concerned with selection procedures were Mr. Jeffery L. Maxey and Mr. James A. Salter.

The work was performed under ARPA Order 1257 and was monitored by the U.S. Army Missile Command under Contract Number DAAH01-70-C-0488.

Meredith P. Crawford
President
Human Resources Research Organization

SUMMARY AND CONCLUSIONS

PROBLEM

Small Independent Action Forces (SIAF) are U.S. or Allied small combat elements designed to carry out operations independent of parent units in insurgency environments. When they are appropriately organized, equipped, and trained, small independent action forces possess capabilities to perform a variety of critical functions. However, such units operate under arduous and stressful conditions. Expert performance in demanding skill areas under extreme physical and psychological stress is a common requirement, and success of missions frequently depends on high levels of individual and team performance. Because human factors considerations play a major role in the performance of SIAF units, effective procedures for selecting and training personnel to serve in such units are of vital importance.

This report describes activities performed by the HumRRO staff during the second phase of a project whose overall objective is the development of procedures for selecting and training personnel to serve in SIAF units. Phase I of the project included analysis of SIAF operational requirements, the identification of job-relevant activities of SIAF personnel, and the development of training materials for six "Identified Critical Areas." Phase II included specification of the critical knowledges and skills required for SIAF performance, preparation of training procedures and materials for developing the required knowledges and skills, and the development and provisional testing of procedures for the selection of SIAF personnel.

APPROACH

The approach in Phase II was to analyze the various SIAF tasks that had been identified in Phase I and to specify knowledges and skills required to perform the tasks. The work then branched into two relatively independent activities: (a) development of training procedures and (b) development of selection procedures.

The development of training procedures involved grouping of knowledges and skills according to content areas, derivation of terminal training objectives for each area, and the development of training materials for each content area not completed in Phase I. For each area, training materials consisted of a Program Description that included terminal training objectives, listings of the knowledges and skills to be developed, recommended subject schedules (including topics to be taught, time allocations, and references), and methods of instruction.

The approach used for development of selection procedures was to survey current selection practices in order to identify personnel characteristics deemed to be important by organizations that perform missions similar to SIAF operations, and to use job analysis data to further identify critical predictor variables and derive criterion proficiency measures. Tests possessing potential for predicting proficiency were identified or developed and were administered to a group of Army Special Forces personnel and a group of randomly selected Army personnel, in a provisional evaluation to identify tests that discriminate between individuals assumed to possess SIAF proficiency and those assumed not to have such proficiency. The tests were integrated into a provisional battery to be validated later, in Phase III of this research, against measures of the derived proficiency criteria.

RESULTS

It was found that 2,172 separate knowledges and skills are needed to perform the 335 tasks involved in accomplishment of SIAF missions. When related knowledges and skills were grouped into "content areas," 25 separate areas emerged, including the six for which training procedures had been developed in Phase I: Land Navigation; Delivery of Indirect and Aerial Supporting Fire; Use of Camouflage, Cover, Concealment, and Stealth; Human Maintenance; Tracking; and Communications. For the 25 content areas, a total of 220 terminal training objectives were developed.

For each of the 19 content areas that had not been dealt with in Phase I, a Program Description was developed. These 19 areas were: Mission, Organization, and Employment of a SIAF; Physical Conditioning and Combatives; Combat First Aid; Use of Individual Weapons; Use of Machineguns; Use of Hand Grenades; Use of Image Intensification Devices; Intelligence; Demolitions; Use and Detection of Mines, Boobytraps, and Warning Devices; Use of Aerial Photographs; Airmobile Procedures; Survival, Evasion, and Escape; Use of Sensors; Use of Small Boats and Stream-Crossing Expedients; Patrolling; Mountaineering; Civic Action, Language Development, and Training of Indigenous Forces; and Leadership. These Program Descriptions and the six developed in Phase I comprise the training materials developed for this project.

In addition, a recommended sequencing of the training segments was derived, and recommendations were developed concerning assignment of the segments to major components of the SIAF program, that is, to General SIAF Training, Special Skills Training, or Environmental Training.

With reference to selection procedures, criterion tests of SIAF performance were developed to cover the following areas—physical conditioning, first aid, intelligence, battlefield movement, land navigation, helicopter insertion and extraction, target detection, boobytrap detection, fire support, communications, and use of weapons. These criterion tests will be used in Phase III for validation of prediction tests.

From the survey of current practices and job analysis data, candidate predictor variables were specified and tests to measure the variables were identified or developed. Thirteen tests that yield 22 separate scores were finally selected.

The tests were administered to a group of 92 Special Forces personnel at Fort Bragg, North Carolina, and 100 randomly selected personnel from the U.S. Army Combat Developments Command Experimentation Center at Hunter Liggett Military Reservation, California. Discriminant Function Analysis procedures were used to analyze the test scores to determine whether the tests would discriminate between the two known groups. It was found that the tests satisfactorily discriminated between the groups and that 90.5% of the test subjects were accurately classified as to group membership by the set of selection tests. The tests thus appear to possess the capability to discriminate between individuals who possess "SIAF-like" characteristics and those who do not. Accordingly, they will be included in the validation study to be conducted in Phase III to evaluate the capability of the test battery to predict SIAF performance proficiency.

CONCLUSIONS

(1) The methods of systems analysis and systems engineering of training materials that were used in Phases I and II are valid and feasible approaches to the development of training.

(2) The training materials that were developed in Phases I and II provide the bases for efficient, economical, and highly effective training for performance in SIAF units. The materials will develop proficiencies required for all SIAF performance, except for certain specialist training that must be obtained in formal service schools.

(3) The selection procedures satisfactorily discriminate between personnel who possess SIAF-like proficiency and those who do not, and will be suitable for use in the validation study to be performed in Phase III of the project.

CONTENTS

Page

Introduction 3
- Military Problem 3
- Research Problem 3
- Phase I Summary 4
  - Analysis of Missions 4
  - Task Analyses 5
  - Early Training in Identified Critical Areas 6
- Phase II Requirements 6
  - Completion of Systems Analysis 6
  - Development of Training Procedures 6
  - Development of Selection Procedures 6

Method 7
- Specification of Knowledges and Skills 7
- Development of Training Procedures 7
  - Specification of Terminal Training Objectives 7
  - Preparation of Program Descriptions 8
- Development of Selection Procedures 10
  - Approach 10
  - Survey of Current Practices 10
  - Development of Criterion Proficiency Measures 11
  - Identification and Development of Prediction Tests 11
  - Provisional Evaluation of Prediction Tests 12
  - Integration of SIAF Selection Battery 13

Results 14
- Specification of Knowledges and Skills 14
- Development of Training Procedures 15
  - Terminal Training Objectives 15
  - Program Descriptions 15
- Development of Selection Procedures 18
  - Current Practices 18
  - Criterion Proficiency Measures 19
  - Prediction Tests 20
  - Evaluation of Prediction Tests 26

Discussion 31
- SIAF Training Materials 31
  - Implications From the Research 31
  - Use of SIAF Training Materials 31
  - Recommended Order of Presentation 32
  - Classes of SIAF Training 32
  - General Implications for Use 34

Page

SIAF Selection Procedures 34
Mean Test Performance 35
Classification 35
Implications for Phase III 35

References 39

Appendices

A A Summary of Training Currently Provided in Subjects Related to SIAF Program Descriptions 41
B Selection Screening Programs in Current Use 46

Tables

1 Summary of Knowledges and Skills and Terminal Training Objectives by Content Area 14
2 Scores Derived From Prediction Test Battery 21
3 Internal Consistency Coefficients for the Tests Comprising the Cognitive Test Battery 25
4 Means and Standard Deviations for Each Score by Testing Group 27
5 Linear Discriminant Coefficients (LDC) for Each Test Score 28
6 Classification of Subjects According to Linear Discriminant Scores 30

Figures

1 Plan of Work for Development of SIAF Personnel Selection and Training 5
2 Frequency Distributions of Linear Discriminant Scores by Group 29

Selection and Training for Small Independent Action Forces: Development of Materials and Procedures

INTRODUCTION

This report describes activities performed during the second phase of a project whose overall objective is the development of procedures for selecting and training personnel to serve in Small Independent Action Forces (SIAF). Phase I of the project included the analysis of SIAF operational requirements, the identification of job-relevant activities of SIAF personnel, and the development of training programs for certain "Identified Critical Areas." Phase II encompassed the construction of training programs for all SIAF activities except those included in Phase I, and the development of procedures for selecting SIAF personnel, to include a provisional evaluation of the selection tests.

MILITARY PROBLEM

Small Independent Action Forces are U.S. or Allied small combat elements designed to carry out operations independent of parent units in insurgency environments. Throughout history, reconnaissance patrols and small combat elements, operating independently of larger units, have played a vital role in military success. In recent years, the trend toward insurgent, guerrilla, paramilitary, and other unconventional types of warfare has placed an even greater premium upon operations to be executed with a minimum exposure of friendly troops, by carefully selected, highly trained, and adequately supported small units.

The potential value of such units has been enhanced by developments in military technology as they pertain to communications equipment; image-intensification devices, and other types of sensors; helicopter and parachute transportation; indirect fire weapons, including a wide assortment of ammunition for mortars, artillery, and naval gunfire; armed helicopter support; and close tactical air support. These developments have made it possible to place at the disposal of small independent forces degrees of mobility, capabilities for intelligence gathering and target acquisition, and volumes of firepower that far exceed the resources available even to combat battalions in the not too distant past.

When they are appropriately organized, equipped, and trained, SIAFs possess capabilities to perform a variety of critical functions. However, such units operate under arduous and stressful conditions. The common requirement is for expert performance in demanding skill areas under extreme physical and psychological stress; success of missions frequently depends on high levels of individual and team performance. For these reasons, human factors considerations play a major role in the performance of SIAF units and, accordingly, effective procedures for selecting and training for service in such units are of vital importance.

RESEARCH PROBLEM

Since the effectiveness of SIAFs may be influenced by a variety of factors both within a unit and external to it, it is useful to conceptualize the SIAF as a system consisting of a number of major interacting components or subsystems. Conceptualizing the SIAF as a system makes it possible to identify and analyze all relevant components

Reproduced from best available copy.

and contributing factors in order that each can be more effectively controlled. In this way, the critical components and factors can be fixed, studied, and manipulated for maximal effectiveness.

The principal components of the SIAF system are:

(1) Mission
(2) Organization
(3) Operational Tactics and Techniques
(4) Equipment
(5) Personnel

It is the purpose of the overall SIAF program to study these components and to determine the best ways of developing and integrating them for maximum effectiveness of the total system. This project, whose second phase is described in this report, is part of the larger program, and is concerned with the Personnel component. The determination of performance requirements and the development of selection and training procedures that will produce personnel to fill the requirements are the immediate objectives.

To be effective, procedures for both selection and training must be based on actual performance requirements. In turn, accurate performance requirements can be determined only from knowledge of characteristics of the system within which performance is to be accomplished, and of the contexts within which the system will function. Therefore, the development of SIAF procedures requires thorough knowledge of the SIAF system and of the environments within which it can be expected to function.

For this reason, initial activities in this project included an analysis of the SIAF system and a determination of relevant characteristics of all components. This analysis made it possible to determine performance requirements and to develop the appropriate procedures for selection and training.

Accomplishment of the project entails four broad types of activities: (a) Systems Analysis, (b) Training Development, (c) Selection Development, and (d) Reporting. Each activity consists of a number of steps occurring within four phases. Figure 1 shows the plan for the project, including the activities, steps, and the phases within which each has been scheduled to be accomplished.

Work accomplished in Phase I has been described in HumRRO Technical Report 70-102, *Selection and Training for Small Independent Action Forces: System Analysis and Development of Early Training*, (Olmstead and Powers, 1970). This report will describe the activities and results of Phase II. Results of Phase III will be reported in a final Technical Report as work is completed.

PHASE I SUMMARY

Activities in Phase I included (a) the use of government-supplied data for analysis of the SIAF system according to types of predicted missions, (b) the use of resulting mission profiles to analyze the various required activities and to develop inventories of tasks to be performed in SIAF units, and (c) the early development of training for certain critical activities for which previous studies had indicated training was inadequate.

Analysis of Missions

Two sources of information were used to identify the various missions performed by SIAF units: (a) documents that reported, described, or discussed activities of small units that operate independently, and (b) detailed interviews of representatives of U.S. or Allied services, agencies, and units that have used small independent teams in recent combat operations.

Plan of Work for Development of SIAF Personnel Selection and Training

Phase	Type of Activity			
	Systems Analysis	Training Development	Selection Development	Reporting
I	Analyze Missions Analyze Tasks	Develop Early Training in Identified Critical Areas		Technical Report
II	Specify Required Knowledges and Skills Develop Proficiency Measures	Develop Training Objectives Develop Training Program Descriptions	Develop Criterion Measures Identify Predictor Variables and Develop Prediction Tests Test Predictor Variables Develop Selection Test Battery	Technical Report
III		Develop Composite Training Test	Validate Selection Test Battery	
IV				Final Technical Report

Figure 1

Analysis of data from these sources yielded profiles of five different types of missions typical of most SIAF operations. The missions differed mainly according to (a) purpose, (b) distance traveled, (c) ratio of combat to reconnaissance activities, and (d) use of indigenous personnel. The profiles are detailed outlines of the characteristics of the various missions and descriptions of the activities of personnel in terms of operational requirements.

Task Analyses

The profiles resulting from the analysis of missions were designed to identify functions performed by SIAF personnel while executing the missions. When identified, the functions were classified according to "activity areas"—groups of related activities—which were then studied to determine those activities common to all missions and those unique to certain ones.

Finally, the analysis yielded a set of Task Inventories—detailed and comprehensive listings of all job-relevant activities of SIAF personnel. A total of 27 Task Inventories were developed and were classified according to subject area. They provided the bases for subsequent development of training materials.

Early Training in Identified Critical Areas

HumRRO had earlier collected data based on post-action interviews with Army personnel in Vietnam, including personnel engaged in long-range patrolling. The data indicated that in certain activities current training was inadequate for developing the performance capabilities required in operations characteristic of SIAF units. These were activity areas in which improved training was obviously needed and could be implemented as soon as program materials were available.

Accordingly, the sponsor requested that training in these *Identified Critical Areas* be developed and be made available at the completion of Phase I. The areas in which training was developed were Land Navigation; Delivery of Indirect and Aerial Supporting Fire; Use of Camouflage, Cover, Concealment, and Stealth; Human Maintenance; Tracking; and Communications.

PHASE II REQUIREMENTS

Work to be accomplished in Phase II included (a) completion of analysis of the SIAF system, (b) development of training procedures, and (c) development of selection procedures.

Completion of Systems Analysis

The Task Inventories that were developed in Phase I were the sources for specification of critical knowledges and skills required for effective performance of SIAF duties. Specification of required knowledges and skills completed the analysis of the SIAF system.

Development of Training Procedures

When identified, the list of critical knowledges and skills was the basis for development of training procedures and materials. Accomplishment of this step required:

(1) Grouping of knowledges and skills according to content or activity areas.
(2) Developing terminal training objectives for each area.
(3) Developing a Program Description for each activity (content area). Each Program Description was to include terminal training objectives, listings of the knowledges and skills to be developed, recommended subject schedules (including topics to be taught, time allocations, and references), and methods of instruction.

Development of Selection Procedures

The results of the systems analysis also provided the bases for development of selection procedures, involving the following steps:

(1) Development of proficiency measures of critical tasks appearing in the Task Inventories.
(2) Development of criterion tests to be used in Phase III for validation of the selection test battery.
(3) Identification of predictor variables and development of tests to measure the variables.
(4) Provisional evaluation of the prediction tests.
(5) Development of test battery from proven prediction tests.

METHOD

The approach in Phase II was, first, to complete the Phase I systems analysis by specification of knowledges and skills required for effective performance by SIAF personnel. Then the work branched into two relatively independent activities: (a) development of training procedures and (b) development of selection procedures. Both activities depended on data developed in the systems analysis; however, procedures for their accomplishment were different so the two activities were performed concurrently but more or less independently. In this and the "Results" sections of this report, the three major activities performed in Phase II will be discussed in turn.

SPECIFICATION OF KNOWLEDGES AND SKILLS

The 335 separate tasks listed in the 27 Task Inventories produced in Phase I were analyzed to determine the knowledges and skills required for their effective performance. As used in this project, a "knowledge" consists of the information required for performance of a specific activity and a "skill" defines the action(s) required to complete the activity.

Initially, requisite knowledges and skills were specified for each of the 335 separate tasks. The resultant lists were then inspected for duplications, redundancies, and candidates for consolidation. After consolidation of some items and elimination of duplicate and redundant ones, the remaining knowledges and skills were categorized into content areas appropriate for the development of training materials.

DEVELOPMENT OF TRAINING PROCEDURES

The development of training procedures involved two main steps: (a) specifying Terminal Training Objectives and (b) preparing Program Descriptions.

Specification of Terminal Training Objectives

When specification of knowledges and skills for a content area was completed, responsibility for the development of training procedures was assigned to that staff member judged to be most expert in the area. The Task Inventory and the list of knowledges and skills for the area served as the basis for development of tentative Terminal Training Objectives for the module.

Terminal Training Objectives are broad statements of performances to be accomplished upon completion of the training and, to be relevant, must encompass the activities described in pertinent Task Inventories. A Terminal Training Objective consists of three parts. Part 1 defines the performance requirement for the relevant aspect of training; Part 2 specifies the conditions under which the requirement is to be met; and Part 3 defines the specific proficiency standards for the requirements.

The research method consisted of evaluation of all knowledges and skills for each content area and derivation of Terminal Training Objectives that would implement these knowledges and skills. This activity involved consideration of all factors that would impact upon training. Terminal Training Objectives that would satisfy all of the performance requirements identified through analysis of the SIAF system were then developed.

Preparation of Program Descriptions

After development of tentative Terminal Training Objectives, the program writer examined the list of knowledges and skills to verify that each contributed to one or more objectives. Since both knowledges and skills and Terminal Training Objectives were derived from the Task Inventories, they are logically related and, in effect, the program writer "blocked out" a training design that indicated the knowledges and skills required for accomplishment of each objective. Related knowledges and skills were then grouped and each group was studied to determine the content and methods that would best accomplish the objective. The writer constructed a logically sequenced training schedule and, finally, wrote a Program Description.

In designing the training and preparing the Program Descriptions, writers adhered to a number of planning decisions that were made during Phase I (Olmstead and Powers, 1970). Of particular relevance for this discussion are decisions concerning the incorporation of certain fundamental training concepts and the content and format of Program Descriptions.

In design of the training, one design concept and three methodological concepts were considered essential for providing program flexibility and for developing the required capabilities among SIAF personnel:

Modular Design Concept. The modular concept of training envisages self-contained modules or training segments that can be either superimposed upon a common core curriculum or assembled in building-block fashion in order to tailor training programs to specific needs of commanders.

Cross-Training. The purpose of cross-training is to develop a widely based source of skills within the SIAF team. Under this concept, each SIAF member will be trained to perform tasks required of other members, regardless of individual assignment. Through this training, all team members will be capable of performing common skills, although secondary specialties will also be required within some teams.

Pre-Team Sensitization. It is important for all SIAF personnel to develop motivation and tendencies for cooperation and teamwork. To develop these characteristics, most training segments include exercises designed to sensitize individuals to the desirability and necessity for intra-team cooperation. Sensitization training is in addition to exercises specifically designed to develop teamwork.

Overlearning. To insure reliability of performance under the extreme stress of combat, skills are practiced to the point of overlearning. This overlearning of critical tasks and skills is designed to compensate for possible decrements in performance that may result from the unusual physical and mental demands that occur during SIAF operations.

Program Descriptions were prepared according to the following format:

1. A two-section *Foreword* whose content is identical for all Program Descriptions.
   a. General. An explanation of the SIAF Training Program, and the assumption of prior training.
   b. Glossary. Definitions of all nonstandard terms common to all Program Descriptions.
2. A 10-section *Body* with content specific to each Program Description.
   a. Introduction.
      (1) General Considerations. An explanation of the necessity of the training in terms of SIAF operational requirements.
      (2) Special Glossary. Definitions of nonstandard terms specific to the Program Description.

b. Program Objective and Scope. A statement of the overall objective of the module, including:
   (1) The general proficiency level to be attained, for example, "general knowledge," "working knowledge," or "qualified."
   (2) The personnel to be trained, for example, "each SIAF member," "SIAF leaders," or "selected SIAF members."
   (3) A statement of the operational tasks in which the general proficiency level will be attained.

c. Training Rationale. A brief discussion of reasons for the particular methodology and design used in the Program Description.

d. Training Methodology. A discussion of the prescribed training methods and of procedures for using them, for the purpose of insuring adherence to the prescribed methodology.

e. Terminal Training Objectives. A list of the training objectives to be accomplished by completion of the module, stated in terms of a task to be performed, conditions under which the task is to be performed, and the performance standard to be attained for the objective by the end of the training.

f. Knowledges and Skills. A list of specific knowledges and skills to be developed by the training prescribed in the Program Description.

g. Training Design. A brief discussion and an illustration of the design of the module showing how each knowledge or skill contributes to appropriate terminal training objectives and is developed in one or more periods of instruction.

h. Schedule of Training.
   (1) Schedule of Training. An outline, by period of instruction, covering:
      (a) Period number.
      (b) Subject(s) for the period.
      (c) Number of hours for the period.
      (d) Method(s) of instruction.
      (e) Scope of the period.
      (f) List of training notes applicable for the period.
      (g) List of references applicable for the period.
   (2) Training Notes. Explanations of items appearing in the training schedule and detailed instructions for carrying out the training.

i. Training Facilities. Instructions or comments concerning facilities required to conduct the training.

j. References. A summary list of references with explanatory comments.

Draft Program Descriptions were reviewed by project leaders and other staff members, and modifications were incorporated. Program Descriptions covering 19 content areas were prepared. Including the six training segments designed in Phase I, the training materials developed in the project consisted of 25 separate Program Descriptions.

During the course of development of the training materials, considerable attention was given to factors related to design of the overall SIAF Training Program. Although the modular concept of training is fundamental for program flexibility, a recommended general framework, to include sequencing of segments, was developed, as were recommendations concerning the assignment of training segments to major components of the program—that is, to General SIAF Training, Special Skills Training, Environmental Training, or Special Mission Training.

DEVELOPMENT OF SELECTION PROCEDURES

During Phase II the development of selection procedures included the following activities:

(1) Analysis of current practices used to select entering personnel by organizations that perform missions similar to those anticipated for SIAF units.
(2) Development of criterion proficiency measures to be used in Phase III for validation of the developed selection test battery.
(3) Identification of predictor variables and development of prediction tests.
(4) Conduct of a provisional evaluation of prediction tests involving determination of their ability to discriminate between two known groups, one consisting of members of "SIAF-like" organizations and one of personnel in a typical TOE Army unit.
(5) Integration of the most effective prediction tests into a SIAF Selection Battery.

Validation of the developed SIAF Selection Battery against performance proficiency criteria will be accomplished in Phase III of this research.

Approach

Development of SIAF selection procedures was governed by one condition different from those usually encountered in selection programs. When most selection programs are developed, the organization and jobs for which selection is to be made already exist and personnel occupy the target positions. Therefore, the conventional procedure is to analyze the jobs as they exist, study characteristics of personnel performing the jobs, develop tests that seem likely to predict such performance, and, then, either (a) administer the tests to all personnel in the jobs to determine ability of the tests to discriminate between higher- and lower-rated performers, or (b) test all applicants for the jobs, predict success or failure according to the tests but employ the applicants without reference to test scores, study their performance on the job over time to ascertain the ability of the tests to predict satisfactory and unsatisfactory performance, and select for a permanent battery those tests that predict best.

However, in the development of SIAF selection procedures, absolute adherence to the conventional procedures was not possible because, at present, SIAF as an organizational entity does not exist and no personnel occupy formally established SIAF jobs. Therefore, applicants could not be tested for later evaluation of job performance and it was necessary to derive criterion proficiency measures from job analysis data rather than using actual performance on the job as the criterion of success or failure.

Accordingly, the approach was to survey current selection practices in order to identify characteristics deemed to be important by organizations that perform missions similar to SIAF operations, use job analysis data to further identify critical predictor variables and to derive criterion proficiency measures, identify or develop tests possessing potential for predicting proficiency, and conduct a provisional evaluation to verify tests that will discriminate between individuals assumed to possess SIAF proficiency and those assumed not to have such proficiency. Those tests proven to discriminate between the two groups would then be integrated into a test battery to be validated in Phase III against measures of the derived criteria.

Survey of Current Practices

During the Phase I survey of current practices, information concerning missions, training methods, and selection practices had been collected from various U.S. services and agencies, as well as from British and Australian forces. Organizations included in the

analysis of selection practices were: U.S. Army Airborne Course, U.S. Army Special Forces, U.S. Army Ranger Course, U.S. Army Recondo Course, U.S. Army Ranger Company, U.S. Army 82nd Airborne Division Recondo Raider and Long Range Ranger Patrol (LRRP) Courses, U.S. Navy Underwater Demolition Team/Sea-Air-Land (UDT/SEALs), U.S. Marine Corps Force Reconnaissance and Stingray elements, Australian Special Air Service Regiment, British Special Air Service Group, and British 16th Parachute Brigade.

It is to be emphasized that the above organizations do not constitute all of the U.S. and Allied units that perform operations typical of SIAF units. For example, the systems analysis performed in Phase I showed that SIAF missions are frequently, and even routinely, conducted by teams organic to conventional TOE units. However, the surveyed organizations possess specialized selection screening programs, and it was important to learn of any special characteristics deemed critical by such units.

In Phase II, current practices were analyzed from the particular standpoint of determining personal and physical characteristics that would be relevant for SIAF selection purposes.

Development of Criterion Proficiency Measures

The task analyses performed in Phase I were the bases for development of criteria proficiency measures. The 335 descriptions of on-the-job performance that made up the Task Inventories were examined for candidate criteria. The search was for performance items which (a) could be quantified and measured, (b) possessed recognized implicit or explicit standards, and (c) were judged to show promise as criteria—to have a special relationship to job success. Candidate criteria were selected with relation to "general" SIAF performance; that is, performance items that were common to all SIAF members were selected. All items that were chosen were judged to be required by all SIAF personnel, and no performances requiring specialized skills were included.

From the list of candidate criteria, a final set to serve as bases for criterion tests was selected by four military experts (retired field-grade officers). Each expert independently selected from the list of candidate criteria the 25 tasks judged to be most critical for successful SIAF performance. Ratings were then pooled and the 25 tasks receiving the greatest consensus among the experts were identified to serve as criteria. For most performances, the experts were unanimous in their selections.

Thus, although the ultimate task of any SIAF is successful completion of its mission, penultimate criteria were developed for the present project, and for each criterion a measure of performance was developed. Effective performance on these tests will serve as the measure of job success in the Phase III validation of prediction tests.

Identification and Development of Prediction Tests

Predictor variables are those human characteristics that are related to criterion performance. Prediction tests are measures of predictor variables, whose scores correlate well with criterion measures. Accordingly, the task was to identify or develop tests that will measure predictor variables and will predict performance on criterion tests.

Data from the survey of current practices and from the task analysis were studied to identify characteristics that appeared to have relevance for SIAF performance. After identification of potential predictor variables, a large number of tests and measuring devices were surveyed to select those that appeared to measure characteristics similar to those comprising the predictor variables. Attempts were made to select tests upon which substantiating data were available, and in most instances this was possible.

The resulting tests included devices that measure experience, attitudes, interests, interpersonal relations, and practical judgment, as well as a questionnaire for collecting

biographical information. Of special interest was a set of cognitive tests that have shown considerable promise when used as predictors in a military setting. Also included was a Personal Information Form for recording entries from personnel records, with special emphasis upon already operational tests such as the Army Classification Battery.

Provisional Evaluation of Prediction Tests

The ultimate goal of the HumRRO SIAF selection project is validation of the test battery. Validation is the process of determining whether a test or test battery will actually predict the performance that it was selected to predict. In this project, final validation of the selection test battery will occur in Phase III with administration of both prediction and criterion tests to two known groups of personnel and correlation of results to determine predictive accuracy of the test battery.

However, in Phase II a provisional test of the tentative predictor battery was included. The objective was to determine ability of the candidate tests to discriminate between two known groups, one (Special Forces) consisting of personnel who were assumed to be proficient in performances required of SIAF members and one consisting of randomly selected soldiers. If the tests successfully discriminated between the groups, they could be assumed to possess some provisional validity; whereas if the tests did not discriminate, they would require modification or discarding.

Tests were scheduled for administration to 100 U.S. Army Special Forces personnel at Fort Bragg, North Carolina, and 100 randomly selected soldiers of the U.S. Army Combat Development's Command Experimentation Center at Hunter Liggett Military Reservation, California. At each location, personnel were scheduled for one day of testing.

The goal of the "known groups" design was to determine whether the selection tests discriminate between two samples of individuals from *a priori* specified populations (criterion groups). The method of Discriminant Analysis was used for treatment of the data because it provided a means for determining:

(1) Whether the two criterion groups differed significantly on the basis of the selection tests.
(2) The best weighting of test scores that would maximize differences between the criterion groups, if the groups were found to be significantly different.
(3) The extent to which the best weighted combination of test scores would successfully classify individuals according to their criterion group when such membership was unknown.

Application of this technique required that two samples (in this case, 100 men each) be drawn from two criterion groups, and that each individual in each sample complete a set of selection tests (in this case, 13 tests which would yield 22 scores). Using these data, the Hotelling T^2 statistic was computed to determine whether a difference existed between the criterion groups on the basis of the 22 scores considered simultaneously.

After the criterion groups were found to be significantly different, a linear discriminant function was derived. The "discriminant function" approach generates a linear combination of predictor test scores that maximizes "between" group differences relative to "within" group differences on the measured variables. That is, this techniques is used to compute the particular weightings to be used in the weighted linear composite of the 22 scores in order to make differentiation between groups a maximum.

This method has the advantages that (a) covariances among the 22 predictor test scores are taken into account, and (b) the procedure explicitly weights the 22 scores in such a manner that the linear composite of the weighted scores takes into account any between-group differences that may exist.

The linear discriminant function was used to compute linear discriminant scores for each individual in each group. These scores were used to classify individuals according to hypothesized group membership. These classifications were then compared with actual group membership to determine accuracy of the classification procedures.

Integration of SIAF Selection Battery

These tests were integrated into a SIAF Selection Battery which will be finally validated in Phase III.

RESULTS

SPECIFICATION OF KNOWLEDGES AND SKILLS

Development of lists of knowledges and skills was an intermediate step in accomplishing the objectives of Phase II. Lists specific to each content area appear in the respective Program Descriptions. The Program Descriptions were products of Phase II and have been delivered to the sponsor.

Table 1

Summary of Knowledges and Skills and Terminal Training Objectives by Content Area

Program Description Number	Content Area	Knowledges and Skills	Terminal Training Objectives
1	Land Navigation	42	7
2	Delivery of Indirect and Aerial Fire Support	248	8
3	Use of Camouflage, Cover, Concealment, and Stealth	52	8
4	Human Maintenance	314	17
5	Fundamentals of Tracking	47	5
6	Communications	98	4
7	Use of Aerial Photographs	18	7
8	Physical Conditioning and Combatives	38	3
9	Use of Individual Weapons	142	15
10	Use of Machineguns	51	11
11	Demolitions	42	9
12	Use of Hand Grenades	71	20
13	Use and Detection of Mines, Boobytraps, and Warning Devices	184	26
14	Combat First Aid	116	7
15	Use of Image Intensification Devices	61	6
16	Leadership	57	12
17	Intelligence	107	8
18	Mission, Organization, and Employment of a SIAF	54	6
19	Airmobile Procedures	107	9
20	Use of Small Boats and Stream-Crossing Expedients	13	3
21	Mountaineering	13	5
22	Use of Sensors	91	7
23	Patrolling	58	8
24	Survival, Evasion, and Escape	61	5
25	Civic Action, Language Development, and Training of Indigenous Forces	87	4
	Total	2,172	220

When the knowledges and skills specified in Phase II were added to those for the six Identified Critical Areas in Phase I, the total number found to be required for effective SIAF performance was 2,172. That is, 2,172 separate knowledges and skills were found to be needed by personnel to perform the 335 tasks involved in the accomplishment of SIAF missions.

Related knowledges and skills were grouped into "content areas," for each of which a separate Program Description was to be developed. The result was 25 content areas, including the six described in Phase I. Table 1 shows the number of knowledges and skills specified for each of the 25 content areas included in the SIAF Training Program.

DEVELOPMENT OF TRAINING PROCEDURES

Terminal Training Objectives

Terminal Training Objectives describe the critical performances, together with proficiency standards, which a trainee should be capable of executing upon completion of a training segment—if the training has been effective. Accordingly, they are both targets for a training segment and criteria by which the segment can be evaluated. As such, they are essential and integral parts of the 25 Program Descriptions (19 in Phase II) developed for SIAF training. Lists of the required objectives appear in each Program Description.

Table 1 shows the number of Terminal Training Objectives for each of the 25 content areas included in the SIAF Training Program, a total of 220 objectives. Successful performance of these objectives at the completion of training will indicate that trainees possess the knowledge and the skills necessary for the effective accomplishment of SIAF missions.

Program Descriptions

An important source of data for training development was the survey of current training practices performed during Phase I. Transcripts of U.S. and Allied interviews, training documents, and research reports were studied to identify training practices in use. These documents and HumRRO experience and research were the basis for development of the training methods that were incorporated into the Program Descriptions. Appendix A summarizes training currently being provided in subjects related to each Program Description developed in Phase II.

The Program Descriptions developed for six Identified Critical Areas in Phase I (the first six items in Table 1) have been described in the Technical Report for that phase. In Phase II, 19 Program Descriptions were developed, providing a training module for each of the 25 content areas. The Program Descriptions are the principal products of Phase II and have been delivered to the sponsor. Brief descriptions follow for each of the 19 modules developed in Phase II (Items 7-25 in Table 1):

7. Use of Aerial Photographs. Provides a working knowledge in the use of aerial photos as map supplements, and to a limited extent, as map substitutes. The training includes 15 hours of instruction, including 4 hours of practical exercises.
8. Physical Conditioning and Combatives. Provides a means of insuring that SIAF members are physically qualified to accomplish the tasks normally required on a SIAF mission, to include crawling or rushing short distances, running moderate distances, climbing over obstacles, moving long distances carrying heavy loads, swimming short distances with and without equipment, entering and exiting from helicopters using various methods, and engaging in close combat with and without weapons. The result is a

module of 38 hours of instruction, including 35½ hours of practical exercises.

9. Use of Individual Weapons. Provides training to qualify SIAF members in the detection and engagement of single and multiple stationary and moving targets with the M16A1 rifle and M79 grenade launcher under varying field conditions, and includes the use of automatic and semiautomatic fire with the rifle, direct and indirect fire with the grenade launcher, and care and maintenance of both types of weapons. The training totals 25 hours, including 19 hours of practical exercises.
10. Use of Machineguns. Provides training to qualify SIAF members to effectively engage point, linear, and deep enemy targets detected within the range and capability of the M60 machinegun under varying field conditions, to include quick-reaction and close combat assault fire. Also includes training on the care and maintenance of the machinegun. Instruction totals 18 hours, including 14 hours of practical exercises.
11. Basic Demolitions. Provides training in the preparation of standard explosives for firing, using electric or non-electric methods of detonation, emplacing charges under the direction of a demolitions specialist, checking firing circuits, firing charges to obtain single or multiple detonations according to desired time procedures, and checking and disposing of misfires. The module totals 21 hours, including 17 hours of combined conference, demonstration, and practical exercises.
12. Use of Hand Grenades. Provides training to qualify SIAF members in the handling, tactical use, and throwing of hand grenades against point and area targets. It includes knowledge of common types of grenades normally employed by a SIAF, such as fragmentation, incendiary, white phosphorus, white and colored smoke, riot control, and practice grenades. The module totals 7 hours, including 5 hours of practical exercises.
13. Use and Detection of Mines, Boobytraps, and Warning Devices. Provides training in the use of the M19 antitank mine, the M18A1 antipersonnel mine, and the M49 trip flare, to include emplacing, arming, firing (if appropriate), and disarming; also includes training on visual detection and avoidance of enemy mines and boobytraps. Instruction totals 21 hours, including 13 hours of practical exercises.
14. Combat First Aid. Provides training that will enable SIAF members to provide emergency medical care under difficult field conditions, to include the basic first aid measures of restoring breathing and heartbeat, stopping bleeding, controlling shock, and protecting the wound; using special measures to treat serious wounds, burns, and fractures; treating common emergencies; using special drugs; and using various methods to transport the sick and injured. The module requires 17 hours for completion, including 14 hours of practical exercises.
15. Use of Image Intensification Device. Provides training to qualify SIAF members in the detection, identification, and accurate engagement of enemy targets with the nightvision sight, AN/PVS-2 (Starlight Scope) mounted on the M16A1 rifle and the M60 machinegun, within the range of these weapons and the night-vision sight. Also includes training in night-viewing techniques, use of the sight in an unmounted role, and operation, care, and maintenance of the sight. Instruction totals 8 hours, including 6 hours of practical exercises.
16. Leadership. Provides training for SIAF leaders and potential leaders. The emphasis is on troop-leading procedures to be used in planning and

conducting SIAF operations; it includes the issuing of orders and supervision of their execution, proper utilization of personnel, developing appropriate SOPs, and obtaining maximum effectiveness by coordinating efforts of the team members. Instruction totals 22 hours, including 14 hours of practical exercises.

17. Intelligence. Provides SIAF members with an understanding of how combat intelligence is produced and used, and a working knowledge of the SIAF's role in this process, to include applying appropriate methods to collect and report information; use of special equipment to assist in gathering information (binoculars, sensors, night-viewing devices, etc.); knowing the enemy's organization, tactics, and techniques; using a camera to record and report information; and using counterintelligence measures to deny information to the enemy, detect their attempts to obtain knowledge of friendly plans and activities, and deceive them as to true plans and intentions. The training totals 13 hours, including 7½ hours of practical exercises.
18. Mission, Organization, and Employment of a SIAF. Provides for a general orientation on the organization of a SIAF, the types of missions that may be executed, operating conditions characteristic of SIAF missions, and operations with indigenous forces. It also provides an overview of training the SIAF member will likely receive and stresses the importance of cross-training, overlearning, pre-team sensitization, and similar concepts. Instruction totals 4 hours, including an hour of practical exercise.
19. Airmobile Procedures. Provides a working knowledge of the capabilities of available helicopters and fixed-wing aircraft, methods of planning and preparing for helicopter insertion, selection, and operation of pickup zones, developing SOPs for loading and off-loading of personnel and equipment and in-flight behavior of team members, selection of landing zones, coordination and execution of an airmobile extraction, and the use of special procedures for insertion, extraction, aeromedical evacuation, and resupply, to include troop ladders, rappelling, McGuire rig, and so forth. The result is a module of 22 hours, including 13 hours of practical exercises.
20. Use of Small Boats and Stream-Crossing Expedients. Provides a working knowledge of expedient methods of crossing unfordable streams and the use of small inflatable boats to cross or travel on inland bodies of water; includes the construction of rafts from commonly carried individual equipment and their use to transport personnel and equipment, the erecting of rope bridges using lightweight rope carried by a SIAF, and the preparation and use of small inflatable boats on inland bodies of water. The module consists of 18 hours of instruction, including 14 hours of combined conference and practical exercises.
21. Mountaineering. Provides a working knowledge of basic military mountaineering techniques that will permit planning and conducting a SIAF operation over moderately difficult mountain terrain; it includes moving limited distances with moderate risk to the individual and his associates, installing and using ropes appropriate for the circumstances, and evacuating casualties using improvised equipment. Instruction totals 32 hours, including 20½ hours of practical exercises.
22. Use of Sensors. Provides training in identifying various types of sensors, being familiar with their capabilities, employing them correctly, checking the circuits of the installed sensors (where required), and camouflaging installed sensors to prevent enemy detection. The module totals 22 hours, including 11 hours of practical exercises.

23. Patrolling. Provides training for SIAF members in preparing themselves and their equipment for a SIAF mission, assisting the patrol leader in planning and preparing for an operation; serving competently in any non-leader position in the patrol, to include point, rear point, compass man, radio-telephone operator, or aid man; employing individual movement and security techniques to reduce the likelihood of enemy detection; performing the actions required in an immediate action drill; and performing required tasks in establishing and operating a patrol base. The training integrates much of that prescribed in other Program Descriptions and is designed in modular form, that is, the training is predominantly comprised of 7 separate practical exercises covering principal types of patrolling operations from which a commander may select those most appropriate to his training needs. The full segment totals 285 hours, including 281 hours of practical exercises, which incorporate conference and critique.
24. Survival, Evasion, and Escape. Provides training in the use of various techniques of evading the enemy while attempting to reach friendly controlled areas, surviving for extended period of time on locally available resources while avoiding enemy detection, and escaping capture by the enemy. Also includes training on standards of conduct when a prisoner of war and methods of survival that can be used when a prisoner of war. Training totals 15 hours, including 10½ hours of practical exercises.
25. Civic Action, Language Development, and Training of Indigenous Forces. Provides training aimed at the overall objective of enhancing the security of an indigenous village and improving the general welfare of the populace. It includes establishing a good working relationship with village leaders and gaining the support of local people, planning and conducting a training program to increase the effectiveness of the local indigenous military force, conducting of civic action projects to improve the general welfare of the populace, participating in military operations with local military force to increase their effectiveness, increasing the flow of intelligence, and developing psychological operations designed to increase the allegiance of the local people to the Central Government. Language training designed to enable SIAF members to reach a minimum level of proficiency would be included as additional training for selected personnel to be obtained at a service school, if appropriate. Training totals 77 hours, including 33 hours of practical exercises.

An additional product is a volume to accompany the Program Descriptions and provide information and guidance for their use. Included are discussions of the modular design of training programs, a recommended sequence of training, and suggestions concerning the development of training based on the Program Descriptions.

DEVELOPMENT OF SELECTION PROCEDURES

Current Practices

The first step in developing SIAF selection procedures was to obtain information concerning current practices from the various U.S. Services and British and Australian forces which select personnel to perform missions similar to those anticipated for SIAF units. Following is a brief summary of findings concerning current practices. (Details concerning specific selection practices appear in Appendix B.)

Entry. The organizations included in the survey generally limit their selection of enlisted personnel to volunteers. This fact reflects two salient features of these organizations. First, they endeavor to maintain an "elite" quality, in the sense that enlisted personnel are not routinely assigned to them. Second, these organizations are popular as evidenced by the fact that procurement supply is greater than the demand, that is, "many feel called, few are chosen." One exception to the rule of voluntary entry is Recondo training.

Phsycial Fitness. All organizations surveyed limit their input to men in good or excellent physical condition, and in addition, prescribe physical performance tests, such as swimming 50 meters, running one mile timed in 8½ minutes, or completing the physical combat proficiency test (PCPT) with a score of at least 300 points. These examples are offered as characteristic, but the physical testing programs vary in difficulty up to the British 16th Paratroop Brigade Program that includes a 17- to 20-mile cross-country run to be performed in 6½ hours. Heaviest emphasis in most selection programs is on endurance and physical ability.

Intelligence. Most organizations (six out of nine) include some estimate of intelligence as a part of their screening programs. Entrance is limited to those who score in the top 50%. U.S. Army Special Forces is the only organization that specifically requires at least high school graduation or successful completion of the General Educational Development Test (GEDT).

Character. The organizations included in the survey generally admit only highly motivated men with good or excellent conduct ratings.

Screening. Most programs lean rather heavily upon screening out undesirable personnel during some initial period of qualification rather than attempting precise selection on the basis of carefully calibrated prediction tests. In short, although selection criteria exist for most programs, these are used principally for eliminating clearly unacceptable applicants. Then, heavy reliance is placed on elimination during an initial period by observation of applicants' actual performance during especially stressful, primarily physical tasks.

Criterion Proficiency Measures

The Criterion Proficiency Measures developed in this phase will be used during Phase III for validation of the developed prediction tests. The criterion tests of SIAF performance cover the following areas: physical conditioning, first aid, intelligence, battlefield movement, land navigation, helicopter insertion and extraction, target and boobytrap detection, fire support, communications, and the use of weapons.

As conceptualized, the criterion performance test sites include both a central complex (with various testing stations) and several field stations (e.g., firing ranges). Plans for these testing stations were developed with representation and simulation in mind. Where performance tests were deemed unfeasible, paper-and-pencil (informational) tests were developed. The criterion measures are: the SIAF Performance Test, the SIAF Knowledges and Skills Test, the SIAF Confidence Inventory, and the SIAF Self and Peer Performance Rating.

SIAF Performance Test. The SIAF Performance Test (SPT) is composed of 16 situations that sample performance in the following activity areas: (1) use of weapons (M16A1 rifle, M79 or M203 grenade launcher, M60 machinegun, M18A1 antipersonnel mine, and M26A1 hand grenade); (2) requesting fire support; (3) radio communications; (4) patrolling, battlefield movement, and sound detection; (5) helicopter insertion and extraction; (6) land navigation; (7) first aid; (8) human target detection; and (9) physical conditioning.

Testing will be performed at two sites. The first site (a "county-fair" system with stations organized consecutively in a roughly circular arrangement), first aid, radio communications, requesting fire support, patrolling, Claymore mine, target detection, and

hand grenade performance will be assessed. At the second site, physical conditioning, helicopter insertion and extraction, rifle, machinegun, grenade launcher, and land navigation performance will be tested. Performance at each station will be assessed by a trained rater who will assign a numerical point value to the testee's performance. The maximum number of points that a testee can accumulate over the entire SPT is 438.

SIAF Knowledges and Skills Test. The SIAF Knowledges and Skills Test (SKST) is a 170-item information test that samples from the following content areas: (1) use of weapons (M16A1 rifle, M79 or M203 grenade launcher, M60 machinegun, M18A1 antipersonnel mine, and M26A1 hand grenade); (2) identification and detection of enemy boobytraps and warning devices; (3) procedures for calling indirect or aerial fire support; (4) use of the field radio and communications procedures; (5) intelligence procedures; (6) patrolling; (7) battlefield movement; (8) detection of enemy soldiers by auditory cues; (9) escape and evasion procedures; (10) tracking procedures; (11) helicopter insertion and extraction procedures; (12) land navigation procedures; and (13) use of image intensification devices and sensors.

The items which compose this test were selected from tests administered to enlisted men enrolled in the Noncommissioned Officer Candidate Course, U.S. Army Infantry School. Items were selected for inclusion in the SKST on the basis of expert opinion and face validity.

SIAF Confidence Inventory. The SIAF Confidence Inventory (SCI) is a 22-item rating scale designed to measure an individual's confidence in his ability to perform in combat situations. Each item of this rating scale describes a combat performance situation. The respondent must read each situation description and then, using a set of 13 word-pairs, describe his ability to perform the task specified by the situation. Each word-pair represents opposing poles of a continuum of confidence which is divided, for rating purposes, into seven differentially weighted intervals. For each word-pair for a given performance situation, the respondent chooses and circles the interval that reflects his opinion of his ability to perform the task specified. The 13 ratings are then summed, providing the respondent's situational confidence score for that performance situation. Finally, the scores for all 22 performance situations are summed and divided by 22 to obtain the respondent's mean confidence score for the SCI.

It is assumed that potential for performance in situations similar to those specified in the SCI is, in part, measured by the individual's self-reports that describe his confidence.

SIAF Self and Peer Performance Ratings. The SIAF Self and Peer Performance Ratings (SSPPR) are ratings made by each individual on a seven-point scale of effectiveness. After the SIAF Performance Test has been completed, each respondent will be asked to rate the effectiveness of his performance during the test. Also, he will rate the effectiveness of each other member of his testing group. The individual's rating of his own performance during the testing provides the self-performance score, and the mean rating of each individual by his fellow group members provides the peer rating score.

It is assumed that both self and peer ratings are valid estimates of overall performance on the SIAF Performance Test.

Prediction Tests

Thirteen tests yielding 22 separate scores were selected for use in the provisional test. The tests are: Interest Opinion Questionnaire, Life History Inventory, Military Interest Blank, Activities Inventory, Team-Task Motivation Questionnaire, seven tests making up a Cognitive Test Battery, and SIAF Personal Information Form which includes scores from the Army Classification Battery. The tests and the scores derived from them are listed in Table 2 and described in the following paragraphs.

Table 2

Scores Derived From Prediction Test Battery

Test and Score	Number of Scores
Interest Opinion Questionnaire	1
Interest Opinion Questionnaire Fighter Score	
Life History Inventory	1
Life History Inventory Fighter Score	
Military Interest Blank	1
Military Interest Blank Fighter Score	
Activities Inventory	3
Activities Inventory Background Confidence Score	
Activities Inventory Background Despair Score	
Ratio of AI Background Confidence to AI Background Despair Score	
Team-Task Motivation Questionnaire	1
Team-Task Motivation Questionnaire Score	
Cognitive Test Battery	7
Auditory Number Span Test Score	
Embedded Figures Test Score	
Number Comparison Test Score	
Similarities Test Score	
Verbal Classification Test Score	
Word Grouping Test Score	
Word Number Test Score	
SIAF Personal Information Form	8
ACB Verbal Score	
ACB Arithmetic Reasoning Score	
ACB Mechanical Aptitude Score	
ACB Pattern Analysis Score	
ACB Army Clerical Speed Score	
ACB Automotive Information Score	
ACB Mechanical Aptitude Score	
ACB Electronics Information Score	

Interest Opinion Questionnaire (IOQ)—Form A. Form A of the IOQ is a 150-item inventory that samples the following categories: (1) the respondent's general interests, 52 items; (2) his personal history, 16 items; (3) his "feelings" relative to certain events and situations, 70 items; (4) his "sense of humor," 5 items; and (5) his "self concept," 7 items.

The questionnaire was developed in Work Unit FIGHTER I, a HumRRO Division No. 3 study in Korea of U.S. Army combat soldiers who were classified as either "fighters" or "non-fighters" during the Korean conflict. The purpose was to determine what personal-history characteristics, personality characteristics, and cognitive factors discriminated the "fighter" from the "non-fighter." The items included in Form A of the IOQ were taken from a larger number of items which had been shown to differentiate between the "fighters" and "non-fighters" ($p<.05$, Egbert, *et al.*, 1958).

In a subsequent study, FIGHTER II, it was found that Form A of the IOQ had a test-retest reliability of .66 ($N = 102$) over a period of two months (Meeland, Egbert, and Miller, 1957). Furthermore, it was found that Form A of the IOQ had a correlation of .67 with an alternate form of the IOQ, Form B, using subjects with no previous military experience. Both of the above correlations were significant ($p<.01$).

Since the IOQ (Form A) is based on items that have been shown to discriminate between known "fighters" and known "non-fighters," it was expected that this test would be useful in the prediction of SIAF performance.

Life History Inventory (LHI)—Form L. Form L of the LHI is an inventory composed of 55 items which sample the following categories: (1) the respondent's socio-economic level, 9 items; (2) the respondent's home environment, 6 items; (3) the respondent's religious background, 1 item; (4) the respondent's health and vitality, 8 items; (5) the respondent's social and educational history, 17 items; (6) the respondent's army experience, 3 items; (7) the respondent's history of participation in different activities, hobbies, and recreations, 9 items; (8) the respondent's childhood social behavior, 2 items.

This inventory was selected because the majority of its items (39 out of 55) differentiated between known groups of "fighters" and "non-fighters" in FIGHTER I (Egbert, *et al.*, 1957).

Military Interest Blank (MIB)—Form HK-3. Form HK-3 of the MIB is an inventory composed of 400 items which sample the following categories: (1) enlisted military occupational specialties, 135 items; (2) officer military occupational specialties, 140 items; (3) specific military situations about which a soldier may have either a positive or a negative attitude, 40 items; (4) specific personal characteristics, mannerisms, and practices of other individuals that a soldier would prefer in a roommate, 35 items; and (5) civilian occupations, 50 items.

The MIB was developed during Work Unit OCS, a HumRRO Division No. 3 research effort concerned with the prediction of motivational failure in Army Officer Candidate schools. The items included in Form HK-3 of the MIB were taken from a 600-item form of the MIB which was administered to 100 entrants and 100 graduates of the three OCS programs—Infantry, Artillery, and Engineer. On the basis of an item analysis, 400 from the original 600 items were selected as discriminaters between the entrants and the graduates of the three OCS programs (Holmen and Katter, 1955).

Data concerning the reliability of the MIB have never been reported; however, data are available concerning the validity of this inventory. Holmen, *et al.* (1954) reported that MIB scores (when the MIB was scored using an Infantry key) of a cross-validation sample of Infantry OCS personnel correlated .61 with a pass-fail criterion of success, while MIB scores (when the MIB was scored using an Artillery key) of a cross-validation sample of Artillery OCS personnel correlated .40 with the same criterion. Egbert, *et al.* (1958) reported that the MIB scores of a known group of "fighters" were significantly different from the scores of a known group of "non-fighters", when the MIB was scored using an empirically derived FIGHTER key. Holmen, *et al.* (1954) also reported that the MIB, when scores on the FIGHTER key, correlated .71 with scores obtained when the MIB was scored on the Infantry OCS key; .50 with scores obtained when the MIB was scored on the Artillery OCS key; and .38 with scores obtained when the MIB was scored on the Engineer OCS key.

These results suggest that the MIB is a useful predictor of success and failure in military programs and has adequate reliability, and that it can be used to discriminate between known criterion groups with a very high level of confidence.

Activities Inventory (AI)—Form PH. Form PH of the AI is a research inventory developed at HumRRO Division No. 3 to provide operational definitions of the Background Confidence and Background Despair concepts described in a conceptual model of

behavior under stress (Kern, 1966). Kern hypothesized that individual resources having direct relevance to stress resistance in combat situations are those that develop over the course of an individual's life experience in physical harm situations. He proposed that these resources be conceived of as two opposing attitudinal factors—a confidence attitude and a despair attitude—which operate only in situations where there exists the possibility of physical harm. The confidence attitude develops as a consequence of (a) being able to exercise control in physically threatening situations or (b) being able to eliminate the threat in such situations. The despair attitude develops as a consequence of (a) being unable to control or (b) being unable to eliminate threat in physically threatening situations.

Each of the attitudes is conceived of as having two components—a background component and a specific or situational component. The strength of the background component is based on all past experiences in threatening situations; it remains essentially the same from situation to situation and is resistant to change after the individual is in his teens or early twenties. The situational component varies in strength as a function of the particular situation, depending on the individual's past experience in similar situations.

Form PH of the AI provides a means of measuring both background confidence and background despair. Part I of the AI consists of a list of 30 activities frequently engaged in by young males during their school-age years. To complete Part I, the respondent indicates the frequency with which he has engaged in each of the 30 activities by circling one of the following responses: (a) never, (b) few times, (c) often, (d) very often. To complete Part II, the respondent indicates, for each of the 30 activities he has engaged in, how often he has had feelings of confidence and feelings of dispair when he engaged in each activity. From the responses to Part I and Part II, it is then possible to derive a numerical index of the respondent's background confidence and his background despair, as well as an index of his resistance to stress.

On a test of pre-Basic and end-of-Basic Training scores in reaction to using the M14 rifle in training, Kern (1966) has found that individuals with high levels of background confidence and low levels of background despair have significantly greater scores on situational confidence-despair (a measure of the relative strengths of the situational confidence and situational despair) than individuals with low levels of background confidence and high levels of background despair.

This result suggests that the AI may be useful in identifying individuals who are likely to be effective soldiers in combat situations.

Team-Task Motivation (TTM) Questionnaire. The TTM Questionnaire is a 24-item inventory that requires the respondent to make either a group (team) or an individual (non-team) oriented response to each item. A high score on this questionnaire reflects a team-oriented disposition while a low score reflects a non-team- or self-oriented disposition.

The items that compose the TTM Questionnaire were selected from an item pool ($N = 78$) developed during Work Unit UNIFECT I at HumRRO Division No. 4.[1] In various combinations, the TTM items have been reported to be significantly related to the acquisition and performance of a variety of team tasks. Individuals who score high on sets of TTM items tend to act for other team members when doing so will clearly improve the team's overall performance. Teams with high scoring individuals serving as key men in communication nets perform at a higher level than do teams where key men score low on the TTM items.

It appears that sets of TTM items tend to measure the individual's team orientation. It was expected that this questionnaire would prove to be useful in the

[1] Clay E. George, research in team training, 1966.

present context since it is likely that one difference between the successful and non-successful SIAF members would be degree of team orientation.

Cognitive Test Battery. The Cognitive Test Battery is composed of seven cognitively oriented tests of ability which were developed at HumRRO Division No. 4.[1] These tests are: the Auditory Number Span Test, the Embedded Figures Test (Short Form), the Number Comparison Test, the Similarities Test, the Verbal Classification Test, the Word Grouping Test, and the Word Number Test.

These tests were developed within a conceptual framework proposed by J.P. Guilford (1968, pp. 6-28) to account for the intellectual behavior of man. Guilford's model, which is called the "Structure of Intellect," is a three-way classification of intellectual abilities, in terms of operations, contents, and products. According to this model, there are five major groups of intellectual operations that humans perform: (a) cognitive, (b) memory, (c) convergent thinking, (d) divergent thinking, and (e) evaluation. Each operation may be concerned with one of four kinds of material or contents: (a) figural, (b) symbolic, (c) semantic, or (d) behavioral. For each combination of operation with content, there are, at most, six general kinds of products that may result from intellectual behavior: (a) units, (b) classes, (c) relations, (d) systems, (e) transformations, or (f) implications. These three general classifications of factors (operations, contents, and products) have been represented by Guilford as a three-dimensional cube with each dimension of the cube representing one of the modes of variation of the factors. Using this model, it becomes possible to describe each intellectual ability and the test which is used to measure the ability in terms of the operation performed, the content on which the operation is performed, and the outcome or product of the operation.

The seven tests in the Cognitive Test Battery represent a limited sampling of the 120 possible intellectual abilities that are contained in the Structure of Intellect model. Two of the tests (Similarities and Verbal Classification) require that the examinee use the cognitive operation (discovery, rediscovery, or recognition). The Similarities Test requires the examinee to discover, at most, six relationships that may exist between two objects. In order to perform this task, the examinee must cognitively operate on two instances of semantic content, several times produce transformations of the content, and specify a relationship that exists between the two objects. The Verbal Classification Test requires the examinee to determine to which of two categories (each defined by four examples) each word in a given list belongs. Here, the examinee must cognitively operate on semantic content to produce classes and at the same time operate on other semantic content to determine to which of the first two classes it belongs.

The Auditory Number Span Test and the Word Number Test both require the use of the memory operation (retention of what has been cognized). The former asks the examinee to listen to and recall a series of numbers spoken aloud at a constant rate of speed. Here, he must remember a series of spoken symbolic content and produce units, which are written down. The Word Number Test requires the examinee to acquire associations between two sets of objects, words and numbers, which are then recalled a few minutes later. To perform this task, he must remember the visual association that has been set up between two sets of symbols so that, at a later time, he can produce the relationship on paper.

The Embedded Figures Test and the Word Grouping Test require use of the convergent-thinking operation (thinking which leads to one right answer or to a recognized best or conventional answer). The Embedded Figures Test requires the examinee to find a simple geometrical figure that is hidden or "embedded" within a more complex geometrical figure. To adequately perform this task, the examinee must use convergent operations and transform complex figural content into simple content. In the Word

[1] Unpublished experimental tests by J. W. Dees.

Grouping Test, the examinee classifies a list of 12 words into four categories, using each word only once. Here, the examinee must operate on symbolic content, using convergent thinking, and produce classes.

Only one test (Number Comparison) requires the primary use of the evaluation operation (decision making). In this test the examinee is required to determine whether two series of numbers are the same or different. In performing this task, the examinee must evaluate two symbolic contents and produce a decision that specifies whether they are identical.

The Cognitive Test Battery is still in an experimental stage at this time and, as a consequence, no data are available concerning the validity of the component tests or their test-retest reliability. However, data on internal consistency are available. In Table 3, the uncorrected and corrected split-half reliabilities are presented for the seven tests in the battery. This table shows that all of the tests have an internal consistency coefficient of at least .76 uncorrected and .86 corrected. It would appear that the tests as a whole have a more than adequate internal consistency.

It was expected that these tests would prove to be useful in differentiating between SIAF and non-SIAF personnel, since it is likely that SIAF personnel will be above average in intellectual functioning.

Table 3

Internal Consistency Coefficients for the Tests Comprising the Cognitive Test Battery

Test	Uncorrected Split-Halfs	Corrected Split-Halfs
Auditory Number Span	.76	.86
Embedded Figures	.91	.95
Number Comparison	.81	.90
Similarities	.76	.86
Verbal Classification	.97	.98
Word Grouping	.84	.91
Word Number	.92	.96

SIAF Personal Information Form (SIF). The SIAF Personal Information Form is a data collection sheet with entry slots for descriptive items and test scores. Of central interest are scores from the Army Classification Battery (ACB).

The ACB is presently in operational use at Reception Stations. According to Kaplan (1968, p. 23), the applicant pool consists of "all replacement stream enlisted male personnel processed through Reception Stations who have not been tested with the Army Qualification Battery at Armed Forces Examining and Entrance Stations."[1] Raw scores on the 11 separate tests of the ACB are converted to "Army Standard Scores"—scores from a normalized distribution having a mean of 100 and a standard deviation of 20. According to Maier and Fuchs (1969, pp. 1-2):

> Each test in the ACB measures a different facet of a man's potential. The Verbal and Arithmetic Reasoning tests are measures of general learning ability; these aptitudes are highly related to academic success. The Mechanical Aptitude Test is a general

[1] Department of the Army. Army Regulation (AR) 600-200, *Enlisted Personnel Management System*, Washington, D.C., March 1965; and (AR) 612-10, *Processing Procedures at U.S Army Reception Stations*, Washington, D.C., May 1969.

measure of mechanical ability, and the Pattern Analysis Test is a general measure of ability to visualize spatial relationships. The remaining tests measure most specialized aptitudes. The Army Clerical Speed Test and the Army Radio Code Aptitude Test measure perceptual speed and accuracy; the clerical test deals with visual perception and the radio code test with auditory perception. These two tests plus the Pattern Analysis Test are the only ones in the Army Classification Battery that do not involve reading. All the other tests in the battery require the ability to read and comprehend an item. The Shop Mechanics, Automotive Information, and Electronics Information tests are useful measures of interest and aptitude, not at the level of the experienced worker in such jobs but at the level of the young men who can learn to do such jobs. The General Information Test is a complex test that spans both the general learning ability and mechanical areas.

The final test, the Classification Inventory, is unique in the battery. Whereas the other tests require the examinee to perform tasks that have a right answer, the items in the Classification Inventory ask the man to describe himself—what he has done, what he likes to do, and how he sees himself as a leader. The items in this test were found to be valid predictors of combat success in research conducted in Korea during active conflict.

Eight of the ACB tests were selected for use in the experimental form of the SIAF Predictor Battery—the Verbal (VE), Arithmetic Reasoning (AR), Mechanical Aptitude (MA), Pattern Analysis (PA), Army Clerical Speed (ACS), Automotive Information (AI), Shop Mechanics (SM), and Electronics Information (EI) tests.

Evaluation of Prediction Tests

For the provisional evaluation of the prediction tests, it was planned to administer the tests to 100 Special Forces (SF) personnel and 100 randomly selected Army personnel who were not Special Forces (NSF).

Subject Attrition. Ninety-two Special Forces personnel appeared for testing. Of these SF subjects, 17 did not complete at least one of the 12 predictor tests; for four, ACB test scores were not available. Therefore, complete data were not available for 22.8% of the SF subjects tested, and these individuals were omitted from the analysis. Thus, scores for 71 Special Forces personnel are included in the final analysis.

Eleven of the 100 NSF subjects did not complete at least one of the predictor tests; for 13, ACB test scores were not available. Therefore, of the 100 NSF subjects tested, 24% did not produce complete test data and were omitted from analysis. Seventy-six NSF subjects were included in the final analysis.

In order to determine whether the proportion of SF personnel who did not produce complete test data was significantly different from the proportion of NSF subjects on whom data were not complete, the z statistic for comparing two proportions (Miller & Freund, 1965) was computed and compared with the critical z statistic for the .05 level of significance. The two proportions were not significantly different, so it is reasonable to conclude that the groups did not differ with regard to attrition.

Discriminant Analysis. Table 4 presents means and standard deviations of the 22 scores for the two groups tested. As a first step in determining whether the test battery will discriminate between SF and NSF personnel, Hotelling's T^2 statistic was computed to simultaneously test the differences between the means of the 22 scores for the two groups. The obtained value of T^2 was 267.08, $F = 10.38$ ($p<.01$, $df = 22$ and 124). Thus, the mean differences considered simultaneously were significant, indicating that the scores, taken together, discriminate between SF and NSF personnel.

Table 4

Means and Standard Deviations For Each Score by Testing Group

Test Score	Special Forces		Non-Special Forces	
	Means	SD	Means	SD
Interest-Opinion Questionnaire Fighter Score	67.6	6.7	63.0	7.9
Life History Inventory Fighter Score	32.5	3.2	30.8	4.1
Military Interest Blank Fighter Score	74.0	13.4	54.4	15.5
Activities Inventory (AI) Background Confidence Score	6.0	2.1	4.7	1.8
AI Background Despair Score	3.0	1.0	3.4	2.0
Ratio of AI Background Confidence to AI Background Despair Score	2.1	0.8	1.4	0.4
Team Task Motivation Questionnaire Score	16.5	3.5	10.8	4.1
Auditory Number Span Test Score	11.9	4.2	11.7	4.8
Embedded Figures Test Score	15.9	4.7	11.2	6.2
Number Comparison Test Score	39.9	9.1	43.0	9.2
Similarities Test Score	16.6	4.2	16.2	4.3
Verbal Classification Test Score	53.9	7.7	49.0	11.5
Word Grouping Test Score	7.5	5.0	7.3	4.8
Word Number Test Score	21.3	7.4	18.6	7.0
ACB Verbal Score	117.9	15.6	102.9	20.8
ACB Arithmetic Score	112.6	13.4	100.7	17.8
ACB Shop Mechanics Score	110.9	14.0	102.7	18.7
ACB Pattern Analysis Score	113.9	15.2	103.3	20.7
ACB Army Clerical Speed Score	109.2	16.8	106.6	19.1
ACB Automotive Information Score	110.1	16.6	104.7	19.3
ACB Mechanical Aptitude Score	113.0	17.4	102.4	18.0
ACB Electronics Information Score	109.8	19.3	98.8	22.6

Since the significant T^2 indicated that the scores for the two groups were different, it was permissible to proceed to analysis of the classificatory power of the tests. Accordingly, the linear discriminant function (LDF) was computed by use of program BMDO4M from the *Biomedical Computer Programs* (Dixon, 1970). Table 5 shows the resulting LDF coefficients for each test, ordered according to magnitude, and the percent relative contribution of each coefficient to a total Linear Discriminant Score (LDS).

The coefficients were then used to derive Linear Discriminant Scores that would be used to classify those taking the tests according to expected membership in the two groups. Using the LDF, a Linear Discriminant Score was computed for each subject, using the formula

$$LDS = \sum_{i=1}^{22} \lambda_i \quad x_i$$

Table 5

Linear Discriminant Coefficients (LDC) for Each Test Score

Test Score[a]	LDC	Percent Contributed by Each LDC to LDS
Ratio of AI Background Confidence to AI Background Despair Score	.016491	87.0
AI Background Despair Score	.004120	5.4
AI Background Confidence Score	−.003020	2.9
Team Task Motivation Questionnaire Score	.002736	2.4
Word Grouping Test Score	−.001550	.8
Embedded Figures Test Score	.001169	.4
Life History Inventory Fighter Score	.000993	.3
Auditory Number Span Test Score	.000964	.3
Number Comparison Test Score	−.000589	.1
Military Interest Blank Fighter Score	.000561	.1
Word Number Test Score	.000496	< .1
ACB Army Clerical Speed Score	−.000280	< .1
ACB Arithmetic Score	.000276	< .1
ACB Verbal Score	.000265	< .1
Similarities Test Score	.000240	< .1
Verbal Classification Test Score	.000194	< .1
ACB Mechanical Aptitude Score	.000185	< .1
ACB Electronics Information Score	−.000113	< .1
ACB Automotive Information Score	.000083	< .1
Interest Opinion Questionnaire Fighter Score	−.000069	< .1
ACB Shop Mechanics Score	−.000062	< .1
ACB Pattern Analysis Score	.000053	< .1

[a]Ordered by magnitude of LDC.

where LDS is the Linear Discriminant Score, λ_i is the i^{th} LDF coefficient, and x_i is the i^{th} score. Figure 2 presents the frequency distributions of LDS by group and illustrates the extent to which the scores discriminate between Special Forces and non-Special Forces personnel.

Each subject was then classified as being either "like SF" or "like NSF" according to the following criterion:

$$L = \frac{\overline{LDS}_{SF} + \overline{LDS}_{NSF}}{2}$$

If a subject's LDS was greater than or equal to L, he was classified as being "like Special Forces." If his LDS was less than L, he was classified as being "like NSF." According to the above formula, L was .16852.

Frequency Distributions of Linear Discriminant Scores by Group

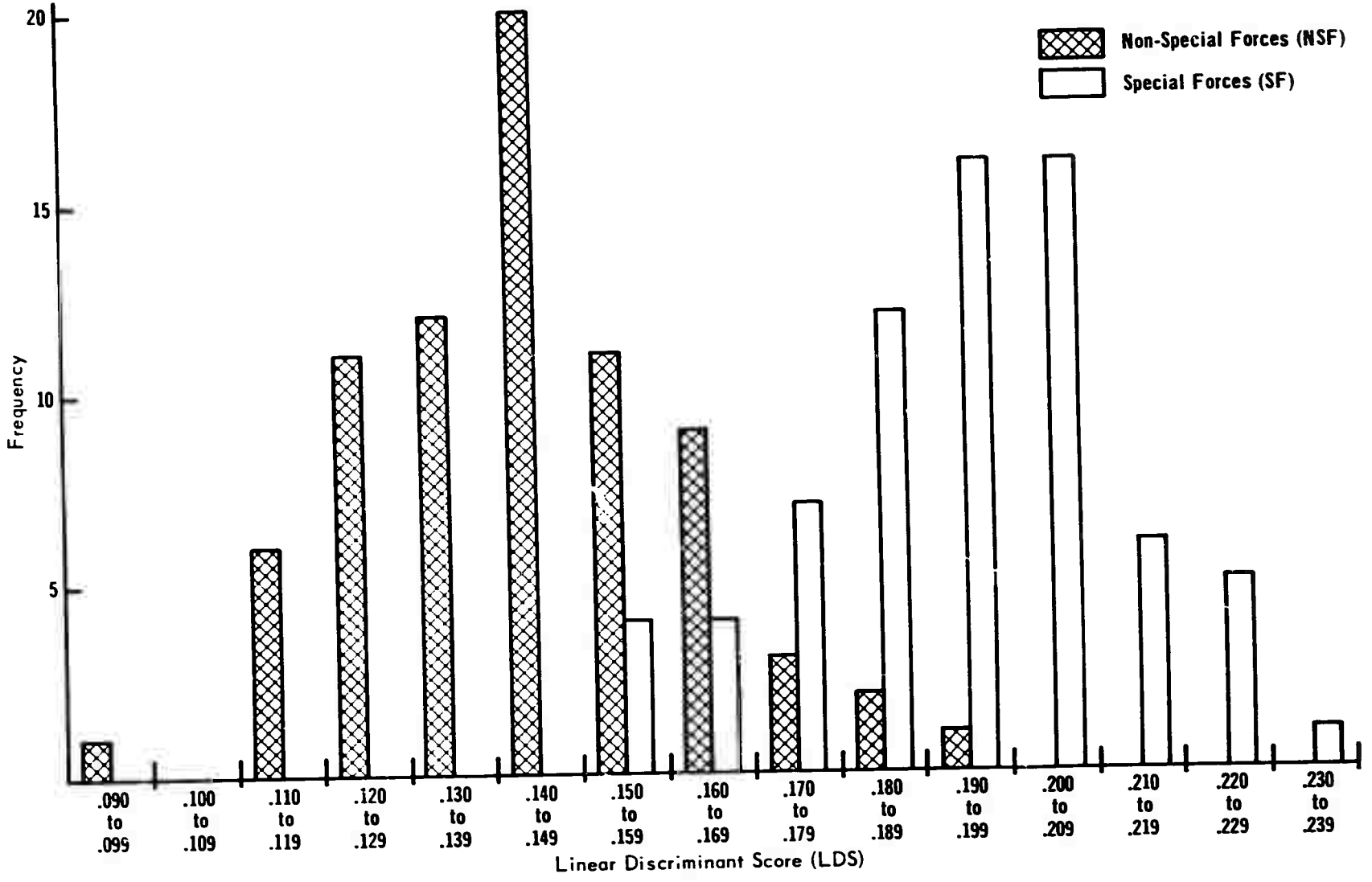

Figure 2

The probability of an incorrect classification using this criterion was the probability associated with the z statistic

$$z = \frac{\frac{\overline{LDS}_{SF} + \overline{LDS}_{NSF}}{2} - \overline{LDS}_{NSF}}{\sqrt{D^2}}$$

where $\overline{LDS}_{SF}$ and $\overline{LDS}_{NSF}$ were the mean Linear Discriminant Scores for the Special Forces and non-Special Forces groups, respectively, and D^2 was the sum of squares of the LDF coefficients.

Using the criterion L, the subjects were classified into one of the following categories on the basis of their discriminant scores:

Category I = Like SF and actually SF
Category II = Like SF and actually NSF
Category III = Like NSF and actually SF
Category IV = Like NSF and actually NSF

The results of this analysis are presented in Table 6. Classifications were correct when subjects were placed in Categories I or IV, and incorrect when they were placed in Categories II or III.

Table 6

Classification of Subjects According to Linear Discriminant Scores

Category	Percentile Score	Number of Subjects Classified Into the Category
I	93–100	63
II	65–92	6
III	31–64	8
IV	10–30	70
	Total *N*	147

Computed from the LDF, the expected percentage of correct classifications is 92%. Actual correct classification for the subjects in this study was 90.5%. Thus, agreement was quite close between theoretical and actual classifications. This indicates a high level of discriminability for the tests in the SIAF battery. The exact degree of excellence of discrimination, would be subject to some "shrinkage" in cross-validation; its order of magnitude, however, indicates excellent promise of the battery for predicting SIAF performance.

DISCUSSION

SIAF TRAINING MATERIALS

The work accomplished in Phase II completes requirements for the development of training materials appropriate for SIAF personnel. During Phase III, a Composite Training Test capable of evaluating this instruction will be developed.

Implications From the Research Method

A major and significant conclusion from this research is that the systematic development of training materials based on explicit operational needs and specific performance requirements is a valid and feasible approach to the development of training. Although the systems engineering of training is a lengthy and expensive process, it can be expected to result in training that is efficient and relevant to operational requirements.

The use of identified lists of knowledges and skills and Terminal Training Objectives as building blocks in the training system provides both quantitative and qualitative support in the area of training design. They provide an effective alternative to use of purely personal opinion about training content needs.

Accordingly, the systems analysis and systems engineering methodology that were used in Phases I and II are highly recommended for any future development of training.

Use of SIAF Training Materials

As stated earlier in this report, the SIAF training materials were developed according to a modular concept. This concept envisions training segments, represented by Program Descriptions, as self-contained modules or "training packages" that can be presented separately or in various combinations according to diagnosed training needs. Thus, a commander having a particular training requirement would review the list of Program Descriptions, select appropriate training segments, and present that instruction to his personnel.

For example, if a commander determined that his personnel were deficient in use of weapons, he would select Program Descriptions for Use of Individual Weapons, Use of Machineguns, Use of Hand Grenades, and, if night operations were required, Use of Image Intensification Devices. If a commander is assigned a mission involving activities for which his personnel are not presently proficient, he can select training modules which will develop the skills required by the mission.

To meet a more general need, a commander whose mission is the training of candidate personnel for assignment to SIAF units may develop a program that includes most of the Program Descriptions—General SIAF Training, discussed below. It is anticipated that this general training will constitute a principal use of the materials.

After the relevant Program Descriptions have been selected, a Master Training Schedule should be developed. In this schedule, training prescribed by each Program Description can be presented in block form, one after another, or instruction, during a single day, may include material from several different modules. In this regard, it should be noted that certain Program Descriptions (e.g., Physical Conditioning and Combatives) *require* that instruction and practice occur over an extended period; where applicable, this requirement is stated in the Program Description.

When the Master Training Schedule has been completed, detailed lesson plans should be prepared for each period of instruction. The SIAF Program Descriptions, together with the references cited in them, contain all information necessary for the production of lesson plans. However, provision for development of lesson plans by the units that will conduct the training permits maximum flexibility and service or mission relevance to be programmed into the instruction. It is this flexibility that makes the training included in the 25 Program Descriptions appropriate for all types of U.S. and Allied forces.

Recommended Order of Presentation

While the modular design of the materials permits scheduling for special needs, a preferred order of presentation of the training segments has been determined. The recommended sequence of presentation follows:

(1) Mission, Organization, and Employment of a SIAF (PD-18)
(2) Physical Conditioning and Combatives (PD-8)
(3) Human Maintenance (PD-4)
(4) Land Navigation (PD-1)
(5) Combat First Aid (PD-14)
(6) Use of Individual Weapons (PD-9)
(7) Use of Machineguns (PD-10)
(8) Use of Hand Grenades (PD-12)
(9) Use of Image Intensification Devices (PD-15)
(10) Communications (PD-6)
(11) Use of Camouflage, Cover, Concealment, and Stealth (PD-3)
(12) Intelligence (PD-17)
(13) Fundamentals of Tracking (PD-5)
(14) Demolitions (PD-11)
(15) Use and Detection of Mines, Boobytraps, and Warning Devices (PD-13)
(16) Use of Aerial Photographs (PD-7)
(17) Delivery of Indirect and Aerial Fire Support (PD-2)
(18) Airmobile Procedures (PD-19)
(19) Survival, Evasion, and Escape (PD-24)
(20) Use of Sensors (PD-22)
(21) Use of Small Boats and Stream-Crossing Expedients (PD-20)
(22) Patrolling (PD-23)
(23) Mountaineering (PD-21)
(24) Civic Action, Language Development, and Training of Indigenous Forces (PD-25)
(25) Leadership (PD-16)

In some instances, training prescribed in one Program Description must be preceded by that covered in another module. For example, it is necessary that Land Navigation training precede Patrolling instruction, unless personnel already possess the level of proficiency required upon completion of the Land Navigation segment. In the few instances where prerequisite training is recommended, the requirement is stipulated in the Program Description.

Classes of SIAF Training

The modular concept permits a commander to adapt training to unique requirements. To assist in program design and planning, all training required for SIAF activities was classified according to four categories or types—General SIAF Training, Special Skills Training, Environmental Training, and Special Mission Training.

General SIAF Training. Many SIAF performance requirements apply equally to all personnel and for all conditions. Training in these activities is classed as "general,"

meaning that it is neither specialist oriented nor environmentally sensitive. The modules included in General SIAF Training are appropriate for all SIAF personnel, regardless of job or of anticipated environments.

One important use for General SIAF Training is as a basic core curriculum intended to train all personnel in the fundamentals of SIAF performance. Thus, a commander might require that personnel to be trained in all areas included in General SIAF Training before participating in SIAF missions. In a similar fashion, the commander of a training installation whose mission is to qualify candidate personnel before assignment to SIAF units might develop a program encompassing all of the modules included in General SIAF Training. Completion of this program would provide all of the general skills required for SIAF performance.

The modules included in General SIAF Training are the first 22 segments as listed on page 32.

Special Skills Training. A second category of SIAF training involves skills normally required only by certain personnel, either because of job assignment with a SIAF or because of mission requirements. The two Program Descriptions included in this category are: (a) Leadership, and (b) Civic Action, Language Development, and Training of Indigenous Forces. It is anticipated that training covered by these Program Descriptions would be administered only to those personnel whose assignments or missions require proficiency in the areas.

In addition, requirements within certain units or geographical areas may call for specialists whose qualifications must be developed by formal training not included in the Program Descriptions. These specialist requirements will most commonly involve:

Foreign Language Training
Radio Communications Training (CW)
Medical Specialist Training
Demolitions Specialist Training

Proficiency in these areas can be developed only by attendance at formal service schools; if a need for these skills develops, personnel should be selected for attendance at the appropriate school.

Several additional training courses that may have occasional SIAF application and that require attendance at service schools are:

Airborne Training (including free-fall techniques)
Nuclear Weapons Training
Underwater Diving and Demolitions Training
Sensor Specialist Training

Environmental Training. In the development of SIAF Program Descriptions, two separate approaches were taken to training for special environments. In the first approach, for many subject areas, certain of the knowledges and skills were developed to be applicable to specific environments and were integrated with those of more general applicability into a single list of knowledges and skills, from which the Program Description for the subject area was designed to be appropriate for many types of environments. An example is the list of knowledges and skills in the Human Maintenance Program Description, where there are items specifically applicable to many different climatic and weather conditions, both extreme and moderate. Most program descriptions are of this type and, with minor modification for special conditions, the training prescribed in them is considered to be appropriate for most environments.

The second approach to environmental training involved instruction that is directed specifically to a particular environment, having all knowledges and skills lists and Terminal Training Objectives directly relevant. The Program Descriptions listed below are of this type. It is assumed that prescribed training would be presented only if a

commander had a specific requirement caused by anticipated operations within the particular environment.

(1) Mountaineering
(2) Use of Small Boats and Stream-Crossing Expedients[1]
(3) Civic Action, Language Development, and Training of Indigenous Forces[2]

Maximum effectiveness in special environments will be achieved when the prescribed training is conducted under conditions as nearly similar to anticipated operational conditions as possible. In addition, for certain unusual conditions it may be necessary to conduct special training not developed in this project. An example would be training in use and maintenance of special equipment that is specifically designed for operations in extreme cold.

Special Mission Training. There will be occasions when SIAF personnel must be trained for special missions that possess unusual or highly specific requirements. It was determined that the best approach for Special Mission Training is for a commander to select those modules having special relevance for the mission, conduct the training prescribed in them, and, then, conduct specific rehearsals that incorporate the unique features of the mission. In this way, training conducted from the Program Descriptions should develop high levels of proficiency in the required skills and the rehearsed training would involve application of the already developed skills to specific situations as required by the mission.

General Implications For Use

The 25 Program Descriptions developed during the project prescribe training specifically designed to meet the operational requirements of SIAF teams, and to develop a high level of proficiency within SIAF personnel, although it does not confer Military Occupational Specialty (MOS) qualification upon the graduate. The training can be administered and used in all environments, although some modification may be required if environmental demands are extreme.

Since this training was systematically engineered to meet these objectives, adherence to the procedures stated in the Program Descriptions will obtain the most effective results. Since Principal Instructors are expected to develop their own lesson plans, following Program Description guidance and consulting the listed references, doctrine and techniques that are specific to a particular service may be incorporated and details of training may be adapted to diverse local conditions. This flexibility was designed into the program so that the training materials would have the widest possible applicability for both United States and Allied forces.

SIAF SELECTION PROCEDURES

To be maximally effective, procedures to be used for selecting personnel must have their bases within actual performance requirements—developed from a knowledge of these

[1] This module appears in both General and Environmental Training because, while its content is appropriate for all personnel, it is recognized that it may be particularly applicable to some special environments.

[2] This Program Description appears in both Special Skills and Environmental Training because (a) it would be appropriate only for personnel selected for civic action and/or indigenous training missions and (b) it provides for adaptation of content according to specific cultural environments as required.

requirements and predictive of criteria that accurately represents performance in the real situation. Of the series of activities necessary to develop selection procedures based on performance requirements, the first four were completed in Phase II of this project. As has been described, these steps are: (1) Identify the essential performance requirements (via mission analyses and task analyses); (2) develop proficiency measures of essential, or critical, performance requirements; (3) develop criterion tests comprised of the various measures of proficiency (for use in validation of the selection test battery); (4) identify predictor variables and develop tests to measure them.

The fifth step—demonstrate the predictive efficacy of the tests by determining the relationship between scores on the tests and scores on criterion tests, that is, validate the SIAF Selection Battery against performance requirements—will not be fully accomplished until the third phase. However, in Phase II a beginning was made with a provisional assessment of the prediction tests to determine their ability to discriminate between two known groups, one of Special Forces Personnel and one of randomly selected Army personnel. In short, the provisional evaluation was conducted to learn whether the tests could discriminate between individuals assumed to have SIAF proficiency and individuals assumed not to have such proficiency.

Mean Test Performance

The results of the provisional test are clear. The significant statistic (Hotelling T^2) indicated that the means of the 22 scores, considered simultaneously, were different for the two groups of personnel, that is, the members of the two test groups responded differently to the set of prediction tests.

The data showed that mean scores for Special Forces personnel were higher than random Army personnel on 20 of the 22 measures. Furthermore, standard deviations for the Special Forces group were smaller for 18 of the 22 measures, indicating that, as a group, the Special Forces personnel were more homogeneous in the characteristics that were measured than were randomly selected Army personnel. Since selection factors determine admission to Special Forces, it is to be expected that these personnel would be more alike, and the fact that their scores on the prediction tests were less variable is an additional demonstration of the ability of the tests to discriminate.

Classification

When Linear Discriminant Scores were used for classification purposes, men taking the test were identified as to their correct groups with an accuracy of 90.5%. The statistically computed expected prediction accuracy was 92%. The accuracy of classification indicates that not only do the prediction tests, as a battery, discriminate between groups in terms of mean performance, but the discrimination can be made between individuals with considerable precision.

Implications for Phase III

The prediction tests discriminate adequately between individuals assumed to possess SIAF proficiency and those assumed not to possess such proficiency. This provisional test was the first step toward validation of the test battery. Since the ability to discriminate was demonstrated, it is now reasonable to proceed to an evaluation of the capabilities of the tests for predicting SIAF performance. This "validation" study will be accomplished in Phase III of the HumRRO SIAF project. Prediction tests and criterion tests will be administered and relationships between scores on the two sets of measures will be determined. Data concerning these relationships will provide guidance for retention or elimination of specific tests within the battery.

REFERENCES
AND
APPENDICES

Preceding page blank

REFERENCES

Dixon, W.J. *Biomedical Computer Programs*, University of California, Berkeley, California, 1970.

Egbert, Robert L., Meeland, Tor, Cline, Victor B., Forgy, Edward W., Spickler, Martin W., and Brown, Charles. *FIGHTER I: An Analysis of Combat Fighters and Non-Fighters*, HumRRO Technical Report 44, December 1957.

Egbert, Robert L., Meeland, Tor, Cline, Victor B., Forgy, Edward W., Spickler, Martin W., and Brown, Charles. *FIGHTER I: A Study of Effective and Ineffective Combat Performers*, HumRRO Special Report 13, March 1958.

Guilford, J.P. *Intelligence, Creativity, and Their Educational Implications*, R.R. Knapp, Great Britain, 1968.

Holmen, Milton G., and Katter, Robert V. *Predicting Motivation to Complete OCS With Interest Inventories*, HumRRO Staff Memorandum, May 1955.

Holmen, Milton G., Katter, Robert V., Jones, Ann M., and Richardson, Irving F. *Research on Motivation and Attrition Problems of the Army Officer Candidate Schools*, HumRRO Interim Report, September 1954.

Kaplan, Harry. *Psychological Testing Programs in the U.S. Army*, Office of the Director, U.S. Army Behavior and Systems Research Laboratory, December 1968.

Kern, Richard P. *A Conceptual Model of Behavior Under Stress, With Implications for Combat Training*, HumRRO Technical Report 66-12, June 1966.

Maier, Milton, and Fuchs, Edmund. *Development of Improved Aptitude Area Composites for Enlisted Classification*, BESRL Technical Research Report 1159, U.S. Army Behavior and Systems Research Laboratory, September 1969.

Meeland, Tor, Egbert, Robert L., and Miller, Irwin. *Field Stress: A Preliminary Study of Its Structure, Measurement, and Relationship to Combat*, HumRRO Staff Memorandum, May 1957.

Miller, I.M., and Freund, J.T. *Probability and Statistics for Engineers*, Prentice Hall, Inc., Englewood Cliffs, New Jersey, 1965.

Olmstead, Joseph A., and Powers, Theodore O. *Selection and Training for Small Independent Action Forces: System Analysis and Development of Early Training*, HumRRO Technical Report 70-102, September 1970.

Preceding page blank

Appendix A

A SUMMARY OF TRAINING CURRENTLY PROVIDED IN SUBJECTS RELATED TO SIAF PROGRAM DESCRIPTIONS

1. The accompanying chart lists hours of instruction presented in various courses in content areas for which Program Descriptions were developed for training of SIAF personnel. Hours shown are those specifically allocated to a subject. In most cases, many additional hours are included on an integrated basis in field training. Types of courses surveyed are those providing prior training (Army BCT and AIT), conventional training (Infantry NCOC-11B40 and Infantry OCS), and SIAF-oriented training (Special Forces, Australian SAS, 82nd Abn Div Recondo and LRRP, USARSO Recondo, DA Recondo Course, LRRP Company, Rangers, and SEALs).

2. Remarks. (Refer to accompanying chart.)
Program Descriptions:
   a. Basic Combat Training
      Item 3. Use of Camouflage, Cover, Concealment, and Stealth: Included in all phases of tactical training.
      Item 9. Use of Individual Weapons: Includes 4 hours familiarization with M72 LAW, M60 machinegun, M79 and M203 grenade launcher, and M18A1 Claymore mine.
      Item 24. Survival, Evasion, and Escape: Code of Conduct Training.
   b. Advanced Individual Training (11B10).
      Item 9. Use of Individual Weapons: Includes 5 hours of M79 training.
      Items 9 & 10. Use of Individual Weapons, Use of Machineguns: Not shown are 50 hours of instruction and practical work in technique of fire for rifle squad.
      Item 17. Intelligence: Intelligence training is integrated into the patrol and field exercise training.
   c. NCOC Course 11B40.
      Item 7. Use of Aerial Photographs: Included with Land Navigation.
   d. Infantry Officers Candidate Course.
      Item 1. Land Navigation: Total hours listed (49) include an 8-hour examination.
      Item 7. Use of Aerial Photographs: Included with Land Navigation.
   e. MACV Recondo School.
      Item 4. Human Maintenance: Incorporated into Patrol training.
   f. Special Forces Light and Heavy Weapons Infantryman Skill Development Course (Example of Specialist Course).
      Item 7. Use of Aerial Photographs: Included with Land Navigation.
      Item 9. Use of Individual Weapons: Basic phase includes familiarization firing of the M16 and M14 rifles, M1 carbine, 45-cal. pistol, AK-47, SKS, M79, A6, and M60 machineguns, plus use of M26 hand grenade. Hours listed for the specialist phase (100) include training on the M1 rifle, M2 carbine, M14 rifle, M16 rifle, Browning automatic rifle, M1903A4 with telescopic sight, Belgian light and heavy automatic rifles, and other foreign rifles. Techniques of offensive and defensive fire are also included.

Reproduced from best available copy.

Hours of Instruction Currently Offered in Identified Content Areas

Program Description	Prior Training		Conventional		SIAF-ORIENTED											
					Special Forces		Australian SASR		82nd Abn Div							
	BCT	AIT	NCOC 11B40 (Inf)	OCS (Inf)	MACV Recondo	Infantry Weapons	CADRE	SPEC.	Recondo	LRRP	USARSO Recondo	ASubjScd 7-13 Recondo	LRRP Co. ATP 7-157	Ranger USAIS	SEALS	SIAF Program Descriptions
(Items)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
1. Land Navigation	10	21	35	*49	15	38	27		47	42	23	20	21	37	9	85
2. Delivery of Fire Support:																
Indirect		4½	23	16	3½	15			6	6	4	4	18	6	*	
Aerial		½	3	5	5	6			3	3	4	2	0	0		28
3. Use of Camouflage, Cover, Concealment, and Stealth	*14	2	4	4			7						6		1	19
4. Human Maintenance	2	1	2	3	*	2		88			*21		54	*103½		7
5. Fundamentals of Tracking		2½	8	8			2			4						17
6. Communications		12	23	29	8	11	13	296	6	19	8	6	*122	1	2	18
7. Use of Aerial Photographs			*	*	1	*2	2			1	2	*	4	3		*5
8. Physical Conditioning and Combatives	29	19	29	24	16½	36	32	90	15	25	20	12½	150	42	*	38
9. Use of Individual Weapons	*88	*33	21	47	5	*107	52			13	6	9	*14	*13	*33	25
10. Use of Machineguns		*40	11	26		39					1		*8	*	*6	18
11. Demolitions		4	5	4		5			5½	5	6		14	6		21
12. Use of Hand Grenades	6	3	1	1½		2	5						3	*	1	7
13. Use and Detection of Mines, Boobytraps, and Warning Devices		13	13	15	2	4	4		3	2	2	3	11	4	2	21

(Continued)

Hours of Instruction Currently Offered in Identified Content Areas *(Continued)*

Program Description	Prior Training		Conventional		SIAF-ORIENTED											
					Special Forces		Australian SASR		82nd Abn Div							
	BCT	AIT	NCOC 11B40 (Inf)	OCS (Inf)	MACV Recondo	Infantry Weapons	CADRE	SPEC.	Recondo	LRRP	USARSO Recondo	ASubjScd 7-13 Recondo	LRRP Co. ATP 7-157	Ranger USAIS	SEALS	SIAF Program Descriptions
(Items)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
14. Combat First Aid	8	4	10	10	6	4	8		5	7½	3	4	28	*	*1wk	17
15. Use of Image Intensification Devices		4	5	5		1				9			4		1	8
16. Leadership	2		16	31		*8				3	8			*		22
17. Intelligence		*	6	12	8	*4			3	19	12	13	54		9	13
18. Mission, Organization, and Employment of SIAF						1					1					4
19. Airmobile Procedures		2	5	9	9	*29			6	15	*10	*11	*86	*28	5	22
20. Water Procedures[a]		2	3	5		8	24	173	5	17	5		*37	19	*	18
21. Mountaineering							*8	*32	5	5	*4	*4	91	*350		32
22. Use of Sensors		1												*5		22
23. Patrolling		18	196	94	25	14	36	222	44	52½	193	84	68	79	*	285
24. Survival, Evasion, and Escape	*1	9	2	2	4	20			17	32	2	2	52	4	*	15
25. Civic Action, Language Development, and Training			4			*66										77
Field Exercises		168			130	504	184		126	140		156	427			
Counterguerrilla	1		53	262									8	367½		
Total Hours in Each Course	352	532	717	1234	265	1441	468		328	582	388	384	1670	1110	5 week pre-deployment training	854

[a]Use of Small Boats and Stream-Crossing Expedients.

*See Remarks.

Items 16 & 17. Leadership and Intelligence: Material of this nature is also integrated into the Patrolling program.

Item 19. Airmobile Procedures: Includes 5 hours of rappelling instructions.

Item 25. Civic Action, Language Development, and Training: Hours listed (66) include 40 hours of Methods of Instruction course designed to enhance Special Forces personnel ability to teach indigenous personnel.

g. & h. Australian SAS.

Item 21. Mountaineering: Hours listed (8) (32) consist of rappelling instructions.

i. USARSO Recondo (Panama).

Item 4. Human Maintenance: Included in 21 hours of jungle training.

Item 19. Airmobile Procedures: Includes 4 hours of rappelling.

Item 21. Mountaineering: Consists of 4 hours of rappelling.

j. Army Subject Schedule 7-13, Recondo Training.

Item 7. Use of Aerial Photographs: Included in Land Navigation.

Item 19. Airmobile Procedures: Includes 4 hours of rappelling from helicopters.

Item 21. Mountaineering: Consists of 4 hours of rappelling training.

k. Army Training Program 7-157 (Long Range Reconnaissance Ranger Co.).

Item 6. Communications: Hours listed (122) include 80 hours of Morse Code training.

Item 9. Use of Individual Weapons: Hours listed (14) include: 4 hours instruction on 3.5 rocket launcher and M72 LAW; 3 hours, M79 grenade launcher; 4 hours, M16 rifle; 3 hours, .45-cal. pistol.

Item 10. Use of Machineguns: Hours listed (8) include: 4 hours instruction on M60; 4 hours, .50-cal. machinegun.

Item 19. Airmobile Procedures: Hours listed (86) include 12 hours rappelling from helicopter.

Item 20. Water Procedures: Hours listed (37) include: 9 hours instruction on stream-crossing expedients; 18 hours, small boat techniques; 10 hours, river navigation.

l. Ranger Training.

Item 4. Human Maintenance: Hours listed (103½) are for bivouac training exercise that emphasizes human maintenance aspects.

Item 9. Use of Individual Weapons: Hours listed include training on orientation firing, tracking (Item 5), ambush techniques, jungle firing, M16 training, instruction on foreign weapons, indirect fire weapons adjustment, and use of perimeter defense devices.

Items 10, 12, 14, & 16. Use of Machineguns; Use of Hand Grenades; Combat First Aid; Leadership: Although not specifically addressed, these subjects are integrated into Ranger training programs.

Item 19. Airmobile Procedures: Hours listed (28) include some Airborne Procedures.

Item 21. Mountaineering: Hours listed (350) are for integrated Mountain/Patrol training. (Mountain Phase of the Program)

Item 22. Use of Sensors: Training is on Patrol Seismic Intrusion Detector (PSID) device. In addition to hours listed (5), personnel use the PSID during Patrolling exercises.

Item-- Counterguerrilla Training: Hours listed (367½) include all patrols in the Florida Phase.

m. SEAL Team Pre-Deployment Training.

Item 2. Indirect Fire Support: One week of training reported.

Item 8. Physical Conditioning and Combatives: Integrated into all phases of training. There are also very stiff entrance requirements.

Item 9. Use of Individual Weapons: Hours listed (33) include training on M16 rifle, M79 grenade launcher, shotguns, pistols, and foreign weapons. Technique of fire and range firing exercises are also included. Not included is a night firing exercise for which no definite hours were listed in the training program.

Item 10. Use of Machineguns: Hours listed (6) include training on both M60 and Stoner light machineguns.

Item 14. Combat First Aid: Individuals attend a one-week combat medicine school at Camp LeJeune, N.C.

Item 20. Water Procedures: Personnel receive extensive training in this area.

Item 23. Patrolling: Some personnel attend Ranger training. During pre-deployment training, personnel receive extensive patrol training to include a one-week exercise in the field.

Item 24. Survival, Evasion, and Escape: Integrated into other training.

3. References.

The following sources were used in compilation of hours of instruction included in the various training programs:

a. U.S. Army Training Program 21-114, April 1970.

b. U.S. Army Subject Schedule 7-11, January 1971.

c. Program of Instruction for 010-11B40-1, Infantry Noncommissioned Officer Candidate Course (11B40), U.S. Army Infantry School, January 1970.

d. Program of Instruction for 2-7-F1, Infantry Officer Candidate Course, U.S. Army Infantry School, November 1969.

e. Training Directive Number 1, MACV Recondo School, Fifth Special Forces Group (Airborne), First Special Forces, APO 96240, Subject: Program of Instruction, December 1968.

f. Program of Instruction for Special Forces Light and Heavy Weapons Infantrymen Skill Development Base Course, USAIMA, October 1969.

g. Trip Report of Visit to Headquarters, Australian Army, Canberra, Australia, and Allied Units, Theodore Powers and LTC (Ret) George J. Magner, HumRRO Division No. 4, March 1970.

h. Program of Instruction, Recondo Raider, 82nd Airborne Division, Fort Bragg, North Carolina (Undated).

i. Program of Instruction, Long Range Reconnaissance Patrol (LRRP), 82nd Airborne Division, Fort Bragg, North Carolina (Undated).

j. Program of Instruction, USARSO Recondo Course (Undated).

k. U.S. Army Subject Schedule 7-12 Recondo Training, March 1970.

l. U.S. Army Training Program 7-157, Infantry Long Range Patrol Company, February 1968.

m. Program of Instruction for 2E-F2/011F2 Ranger Course, U.S. Army Infantry School, April 1969.

n. Trip Report of Visit to Navy Special Warfare Group Atlantic, Little Creek, Norfolk, Virginia 23521, LTC (Ret) George J. Magner, HumRRO Division No. 4, April 1970.

Appendix B

SELECTION SCREENING PROGRAMS IN CURRENT USE

THE AIRBORNE COURSE (U.S. Army)

The U.S. Army is the primary source of input for the Airborne Course. Other services (foreign and domestic) also use this course for training selected personnel. Entry is limited to volunteers who have completed Basic Combat Training and Advanced Infantry Training or equivalents. There is an age limit of 36 years on the date of application. Applicants must have a minimum score of 80 on the Infantry Aptitude Area (IN) or the Combat Aptitude Area A (CO—A) or have MOS inserts 11, 12, 15, 16, or 17. Airborne training has no restriction on education and no restriction on security clearance. Applicants must have an obligated service of 12 months upon completion of the training.

Applicants must take the physical combat proficiency test (PCPT); they must be able to do 6 chin-ups, 80 knee benders in 2 minutes, 20 sit-ups, 22 push-ups, and run a mile in 8½ minutes; all of these tests must be completed within one hour. Applicants must be in general excellent physical condition, and their medical exams must not be more than one year old at the time of application.

Applicants must not have more than 30 days of lost time in their current enlistment. They must not have a pending court-martial or be under any investigation which may result in court-martial.

SPECIAL FORCES (U.S. Army)

The source for Special Forces personnel is the U.S. Army. Entry for enlisted men is limited to volunteers who have completed Basic Combat Training, AIT, and basic Airborne or Airborne volunteer training. Applicants must be 19 years of age prior to training. They must score 100 or higher on IN or CO—A. There is no restriction on the MOS. Applicants are required to have finished grade 12 or the GEDT. Applicants must have a Confidential security clearance and an interim Secret clearance before Special Forces duty. They must have 18 months of obligated service upon completion of training. Special Forces volunteers must meet the same physical tests as Airborne volunteers, and in addition, they must swim 50 meters. The physical examination is the same as for Airborne training.

Applicants must obtain the following scores on the Special Forces selection battery: (a) a score of at least 380 on the battery test regardless of the score achieved on the critical decision test, or (b) a score from 370 to 379 on the battery test in addition to a score of at least 50 on the critical decision test. (Retesting with the Special Forces selection battery is not authorized.) Volunteers for Special Forces, in addition to meeting Airborne character requirements, must have no general court-martial on record, and no special court-martial during the current enlistment.

UDT/SEALs (U.S. Navy)

The source for Underwater Demolition Team/Sea-Air-Land (UDT/SEALs) volunteers is the U.S. Navy. Applicants must have completed basic training, Underwater Demolition Training, and field training. They must be between 18 and 31 years of age. Applicants must score at least 50 on the Navy's General Classification Test (GCT). There are no restrictions as to Naval Enlsited Classification (NEC), no restrictions as to education, and no restrictions as to clearance. SEALs must have 24 months obligated service upon completion of training. The physical tests for SEALs is very strenuous. They must run one mile in seven minutes, swim 300 meters in 7½ minutes, and they must be able to swim 25 meters under water. They must be able to do 25 push-ups, 10 to 15 pull-ups, and they must pass the oxygen tolerance test. The physical exam is the same as the Navy flight physical examination. SEAL volunteers must show good performance evaluation marks and must not be a chronic offender.

RANGER COURSE (U.S. Army)

The Ranger Course accepts volunteers from Army company-grade officers and noncommissioned officers. There are no restrictions on education, no restrictions in MOS, and no restrictions in security clearance. Applicants must have nine months obligated service upon completion of the training. The physical test for the Ranger Course requires the applicant to complete a 40-yard low crawl in 36 seconds, successfully traverse a horizontal ladder with 36 rungs, perform the dodge-run-and-jump in 25 seconds, complete the grenade throw with 15 points, run one mile in 8½ minutes, and successfully complete a 50-meter swim. Applicants must pass the combat water-survival test. Physical examination must show that the applicant is in excellent physical condition. Enlisted entrants into the Ranger Course must have excellent ratings in efficiency and conduct.

FORCE RECON COMPANY (U.S. Marine Corps)

The USMC Force Recon Company has as its source of input the U.S. Marine Corps. (Force Recon Company and Division Recon Battalion contribute elements to STINGRAY operations.) Volunteers must have completed basic training and be a Marine infantryman. Applicants must be career-oriented. Physical fitness testing is unit-administered. Applicants must be in excellent physical condition and meet requirements for Airborne and UDT training. Volunteers must be highly motivated and have an excellent character and efficiency rating.

RECONDO TRAINING (U.S. Army)

The source for Recondo training is the unit conducting the training. Entry is limited to SP 4 through company-grade officers who must have completed Basic Combat Training and AIT or equivalent. MOSs in the combat arms area are desired. Physical fitness tests for Recondo training require a minimum of 300 points on the physical combat proficiency test (PCPT), completion of the 50-yard low crawl in 36 seconds, successful traversal of a horizontal ladder with 36 rungs, completion of the dodge-run-and-jump in 25 seconds, completion of the grenade throw with 15 points, completion of the one-mile run in 8½ minutes, and successful completion of a 50-meter swim. Applicants must be in excellent physical condition, must be highly motivated, and must have excellent character and efficiency ratings.

RECONDO RAIDER AND LRRP (82nd Airborne Division, U.S. Army)

The source for the 82nd Airborne Division Recondo Raider course and the 82nd Airborne Division Long Range Reconnaissance Patrol (LRRP) course is the 82nd Airborne Division. Entry is limited to E4 through E6. Volunteers must have completed Basic Combat Training, AIT, and Airborne training, and must have six months obligated service upon completion of training. The physical fitness test requires a score of at least 350 points on the PCPT within 30 days of entrance. Applicants must have a swimming capability, must be in good physical condition, and must achieve a score of at least 70% on a map reading screening test. Applicants must be familiar with individual weapons. Excellent conduct and efficiency ratings are required, and applicants must be highly motivated.

SPECIAL AIR SERVICE REGIMENT (Australia)

The Australian SASR has as its preferred source of input men from the Infantry. Volunteers must have completed CDP-3 training (similar to U.S. Army AIT). Applicants must be 18 to 30 years of age and have an intelligence rating of SG-3. Applicants must have a sixth-grade ability in education and have 15 months remaining in the service after reporting to training. The physical fitness test requires that applicants pass a pre-parachuting medical examination and be able to swim. In the physical examination, applicants must have a PULHEEMS profile not less than 2222 8/38/322. Applicants must be qualified parachutists or volunteers. Applicants must be approved by an SAS officer and a staff psychologist. The preference is for single men. Applicants must not have (1) been awarded imprisonment, (2) over 28 days of detention or field punishment, (3) a bad record of AWOL, or (4) been reduced for disciplinary reasons more than once.

16TH PARATROOP BRIGADE (British)

Volunteers for the British 16th Paratroop Brigade are taken from the British Army and must have completed basic training. Applicants are given intelligence tests and are expected to be better educated than the rest of the Army. The physical fitness testing stresses endurance, requiring applicants to complete:

(a) A recruit test that asseses agility, coordination, and stamina.
(b) A five-mile run with boots but no equipment on the first day.
(c) An assault course twice within eight minutes.
(d) An orienteering course in 1 hour and 15 minutes.
(e) 14 to 15 miles with pack over easy terrain in 2 hours and 55 minutes.
(f) Four confidence tests above ground.
(g) A 1½ mile steeple chase in 8 minutes and 20 seconds.
(h) A 6½ mile speed march with pack in 55 or 60 minutes.
(i) A 1¾ mile log race in 13 minutes and 44 seconds.
(j) A 17- to 20-mile cross-country run in 6½ hours.
(k) 12-man squads of applicants must carry a 300-pound man on a stretcher a distance of 7 to 10 miles in 1⅔ hours.

All of these physical fitness tests are accomplished in nine working days. As a consequence, applicants must be in good physical conditions. Assessment is accomplished by an intelligence team.